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August 9, 1945

# Mill Employment and Payrolls Up Slightly

## Wisconsin Commission Reports Fractional Rise In Workers and Increase In Payrolls In May—John H. Strange Made President—Water In Reservoir Gains—Thilmany Buys Land—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., August 6, 1945—Manufacturers of paper and allied products reported an increase of 0.4 in the number of workers employed during June as compared with May, according to the monthly report of the Industrial Commission of Wisconsin at Madison, Wis. Estimated weekly payrolls, however, were up 0.9%, the figures being $945,000 during June, and $936,000 during May. Average weekly earnings amounted to $41.54 for 49.2 hours, at an average rate of 84.5 cents per hour.

In the Milwaukee metropolitan area, 21 manufacturers of paper and allied products reported 2,054 persons on their payrolls. This was a decline of 0.8% when compared with May. Average weekly payrolls were 0.3% higher, the total being $81,937. Average weekly earnings were $39.89 per hour, and the average work week was 46.1 hours. This amounted to 86.5 cents per hour.

### Water in Reservoir Gains

High evaporation—1.09 inches—was reported by the Wisconsin Valley Improvement Company, Wausau, Wis., in its reservoir system during the week ending July 29. During that period a total loss of 714,000,000 cubic feet of water in the system was reported. Total storage amounted to 14,795,000,000 cubic feet as compared to 10,756,000,000 cubic feet at the same time last year. Average rainfall at 25 stations was .74 of an inch, bringing the total for the present year to 17.55 inches, 2 inches more than the average during the last 55 years.

### John H. Strange Elected President

John H. Strange, Appleton, was elected president of the John Strange Paper Company, Menasha, Wis., at a meeting of the board of directors Monday, July 30, to succeed his father, the late Hugh M. Strange.

A change in the ownership of the capital stock and officers has been announced. The stock is now held by six converters, who have been consumers of the company's products, and the Hugh M. Strange estate. Among the converters are the Menasha Woodenware Corporation and the Wisconsin Container Corporation; both of Menasha.

Other new officers include Joseph L. Gidwitz, Chicago, vice president; George W. Hinton, Appleton, treasurer, and J. L. Levandoski, Neenah, secretary and assistant treasurer.

A notice was posted at the company's Menasha mill and its Stevens Point Pulp and Paper Company division at McDill, Wis., last week over the signature of Mr. Strange, saying that the company will continue to operate as it has in the past. Present personnel will be maintained, and "traditional standards and broad policies" will be pursued.

"It should be clear that the future of the company and everyone associated with it is strengthened by an assured market for an important portion of its production and by the experienced counsel which will be available through its new board of directors," the notice declared.

### Folke Becker Elected a Director

Folke Becker, president and general manager of the Rhinelander Paper Company, Rhinelander, Wis., was elected to the board of directors of the Old Line Life Insurance Company of America at the board's quarterly meeting August 2 in Milwaukee, Wis. He succeeds the late W. H. Ryan of Appleton.

### Barn Dances Entertain Mill Workers

WLS Barn Dance entertainers and a carnival were among the features Sunday, August 5, when the Kimberly-Clark Corporation employes held their annual picnic at Neenah, Wis. Bernie Dunn of WLS was master of ceremonies for the afternoon and evening programs. A ferris wheel, merry-go-round and children's auto rides were some of the carnival features. Ponies for children were available, and a German band played all day on the grounds.

Two baseball games featured the morning activities on the Lakeview diamond.

There was a tug-of-war between Badger-Globe employes and those from Lakeview. Several hours were set aside for children's contests. A Neenah orchestra presented music for dancing in the Riverside park pavilion during the afternoon and evening.

### Appleton Coated Paper Co. Hold Outing

Employes of the Appleton Coated Paper Company, Appleton, Wis., and their families and friends had their annual picnic August 5 in Erb park at Appleton. Games, contests and other entertainment were on the program. There were pony rides for the children.

### Thilmany Co. Purchases Land

Thilmany Pulp and Paper Company, Kaukauna, Wis., has purchased a parcel of land, approximately six acres, from the city of Kaukauna. The property is located on the Fox river bank, part of the old Patten Paper Company property.

# No Impending Change in Canadian Exchange

## Minister of Finance Denies Intention of Dominion Toward Exchange Parity With United States—Newsprint Mills Now Benefit By $6.10 A Ton — Organize Action On Forests — Other News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., August 6, 1945—The federal Minister of Finance has contributed much cheer to the outlook of the pulp and paper industry by denying any move on the part of the Government, either in the immediate future or in the long-term prospect, towards dollar exchange parity as between Canada and the United States. At present the 10% premium on United States funds received in payment of pulp and paper exports, when these funds are exchanged into Canadian dollars, represents a substantial part of the income of Canadian manufacturers, and a return to parity would cost the newsprint firms $6.10 per ton on the bulk of their output.

Pulp and paper cargoes have long been, and still are, the mainstay of Canadian purchasing power in the United States, creating a favorable balance of exchange of over $300,000,000 a year. Even during the depressed times of 1930-35 the newsprint industry alone gave Canada a revenue of $563,000,000. Considered as a unit in all it branches, forest utilization has a relatively gigantic effect on the national economy. Some 400,000 men in Canada take wages from forest operations, and one in every 11 of the men, women and children of this country lives mainly by the harvest of logs. Forest industries employ more men and pay more wages than any other industry in Canada, and is the country's most reliable stabilizer of national purchasing power abroad.

The fact that the chief bulk of the forest products is exported, and the fact that the 10% premium received on U. S. funds is important in offsetting increased war costs, and thus of keeping prices to American consumers down to their present levels, is another consideration, for undoubtedly a return to dollar parity would have far-reaching consequences in complicating the price outlook and imperilling the ability of the forest industries to maintain employment and wage scales.

Interesting in connection with the Finance Minister's announcement is the news from Washington that, according to a Treasury spokesman, the exchange rate between Canadian and United States dollars, once fixed under the Bretton Woods Agreement, must be kept at that figure by each country, and that any later change in the rate may then be made only according to express provisions of the Agreement, recently approved by Congress. The spokesman was reported to have added that there was little likelihood that, when the exchange rate is agreed upon, there would be much, if any, change from the current rate.

### Seeking German Industrial Data

Representatives of the pulp and paper industry are included in a group of 24 Canadian industrial and scientific research men who are undertaking a trip to Germany to seek out business and scientific secrets in that country. The trip is government-sponsored and financed. The idea is to find out what is available, or likely to be available, in Germany by way of patent and other knowledge, so that if Canada is a recipient of "reparations", industrial and scientific information which would be of value to this country might form one important item.

### Forestry Association Combats Tree Planting

The Canadian Forestry Association, an influential and nationwide organization, is combating the popular idea that forests can be conserved by replanting. Robson Black, of Montreal, president of the Association, remarked in an address to the Canadian Manufacturers Association, that one of the most mischievous suggestions ever made was that a woodsman should be compelled to plant three trees for every one he cuts. "Except on land which has been absolutely denuded, such as barren lands and rocky areas," said Mr. Black, "every forest engineer sticks to the practice of making a forest reproduce itself. There is not any necessity whatever for planting trees. The better plan is that of letting the forests reproduce themselves. The cheerful truth is that Canada can have all the trees it wants. If we need an extra billion spruce or pine to equip the generations ahead we can have them. We can double the yield of a large proportion of our forest lands; and the engineering science and management plans involved do not differ seriously from those applied daily in a score of successful Canadian industries."

### Organizing Action on Forests

Recognizing the fact that scores of organized groups throughout Canada are now ready to cast their weight behind forest conservation, the Canadian Forestry Association has appointed Fraser S. Keith as a vice-president and special executive officer of the board of directors, with the special task of organizing co-operation in public forest policy on the part of Boards of Trade and other business groups, and to bring associations of manufacturers, rural municipalities, professional societies, etc., into working partnership with the Association for the advancement of forestry and its many allied interests. Mr. Keith, who was recently elected a governor of McGill University, was for twenty years manager of the Department of Development, Industrial and Public Relations of The Shawinigan Water and Power Company, and for eight years previously was secretary of the Engineering Institute of Canada. He was president of McGill graduates society for 1943 and '44, and holds a degree in electrical engineering.

### Nova Scotia Buys Woodlands

The province of Nova Scotia has embarked on a program of buying woodlands to ensure stability of forest industries in the coming years. Already 250,000 acres of woodlands have been bought and it is expected that another 750,000 will be acquired in the next few years. The Forestry Department anticipates that within 20 years privately-owned lumber and pulp companies will be faced with a timber shortage, and Crown land stumpage will then be used to keep the lumber and pulp and paper companies supplied.

# THIS PICKLING TANK WAS BUILT TO LAST...

## 5 YEARS' SERVICE
## NO EVIDENCE OF ATTACK

FIVE YEARS AGO this tank began taking the terrific punishment of continuous pickling at 210° F. A recent thorough inspection showed no evidence of attack on the Asplit Cement that bonds the bricks. It has actually resisted acid and abrasion better than the bricks themselves.

Minimum construction costs are possible through the use of very thin Asplit joints, yet these thin joints are not attacked by hot acid and corrosive vapors.

• • •

Our long experience with corrosion problems qualifies us to offer our recommendations in a wide variety of constructions. Write to us about your problem—no obligation.

**SPECIAL CHEMICALS DIVISION PRODUCTS**
Acid, Alkali, and Solvent proof cements • Lead Fluoborate Concentrates • Fluoboric acid • Acid, Alkali, and Solvent Emulsion Type Cleaners • Paint Strippers • Pickling Agents.

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MANUFACTURING COMPANY
Chemicals
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SPECIAL CHEMICALS DIVISION
PENNSYLVANIA SALT MANUFACTURING COMPANY
Dept. PTJ, 1000 Widener Building, Philadelphia 7, Pa.

I would like to have you send me free information on Pennsalt Asplit Cement Bulletin No. 5.

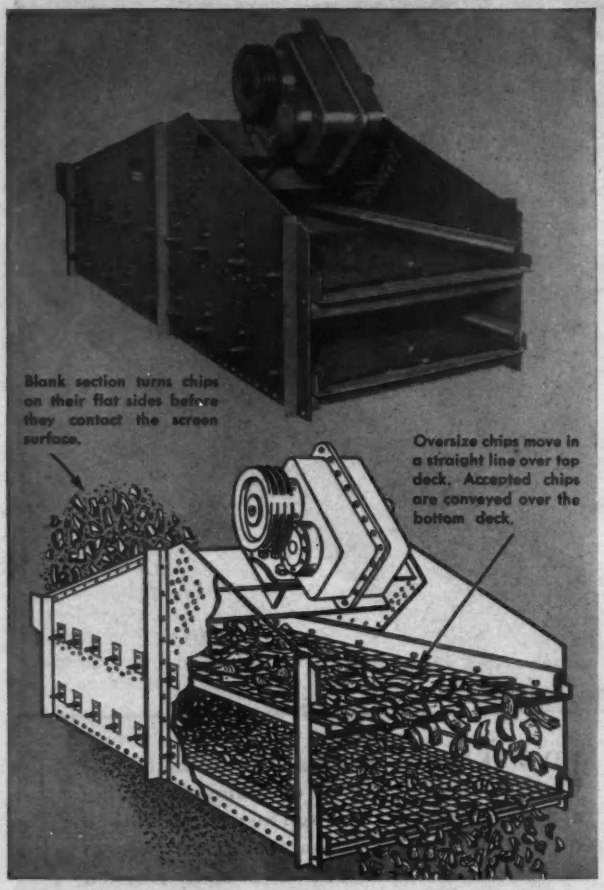
NAME_____

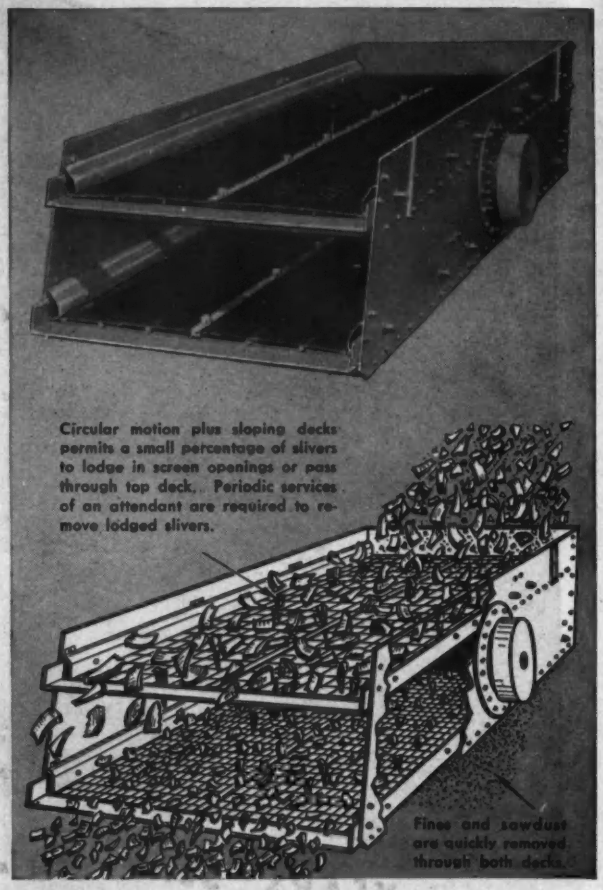
TITLE_____

COMPANY_____

ADDRESS_____

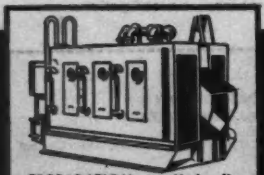
# Which Chip Screen is


Blank section turns chips on their flat sides before they contact the screen surface.
Oversize chips move in a straight line over top deck. Accepted chips are conveyed over the bottom deck.


Circular motion plus sloping decks permits a small percentage of slivers to lodge in screen openings or pass through top deck. Periodic services of an attendant are required to remove lodged slivers.
Fines and sawdust are quickly removed through both decks.

**1** **THE LOW-HEAD CHIP SCREEN** with its *horizontal* decks and 45° straight-line motion gives you the *highest percentage of uniform size chips.* Reason is that all chips are carried in a straight line — *on their sides*—with acceptable chips passing through, rejects and long slivers passing over, the top deck. Low-Head gives you *bigger capacity* than comparable size inclined screens, and *saves manpower* — practically eliminates need for attendant to remove slivers!

**2** **THE RIPL-FLO CHIP SCREEN** with its 25° *inclined* decks and circular motion gives you an *average percentage of uniform size chips.* For many grades of pulp, Ripl-Flo is a good buy . . . for 3 principal reasons: 1) It does as good or better screening job than *any* inclined screen; 2) It is *lower in initial cost* than most comparable size screens; 3) Has *only 2 bearings* — takes less power, less maintenance than conventional 4-bearing screens!



**PREPARATION** — Hydraulic Barkers, Chip Screens, Saws, Slashers, Interplane Grinders.

**COOKING** — Digesters, Blow Tanks, Kilns, Slakers, Heat Exchangers, Condensers.

**WET ROOM** — vibrating-type screens for use as Thickeners, for dewatering rejects.

**PAPER-MAKING** — special design Drives for Paper Machines, Rewinders, Calenders.

**ALLIS CHALMERS**

# Best for You?

## *That depends on your particular needs! At Allis-Chalmers you can select from 2 different Screens—each designed to size a different quality of chips!*

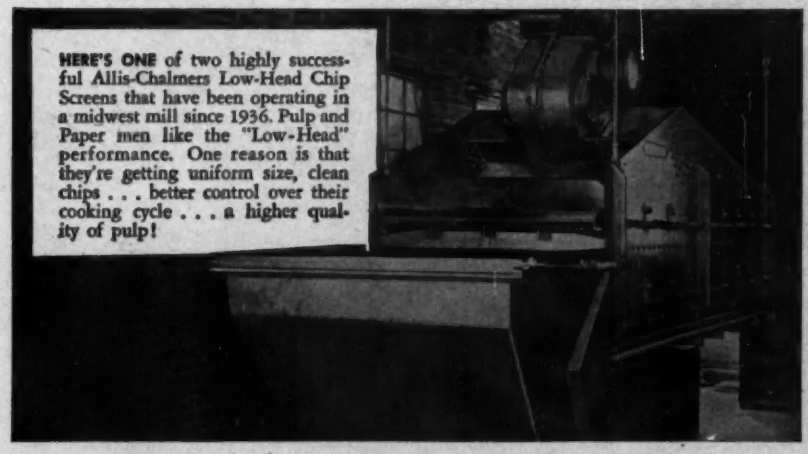
ALTHOUGH most operators agree they'll eventually standardize on *Vibrating-type* Chip Screens, they *don't* agree that *all* such screens will give them comparable results.

For *correct* selection depends on the *individual* mill . . . is based on such factors as: quality of pulp to be produced; type of chippers; available manpower, etc.

*That's the reason A-C offers you 2 different types of vibrating Chip Screens* . . . wants to know the *complete facts* about *your* particular operation before it makes a recommendation to you!

For helpful, preliminary information on selection and application of Chip Screens, send for Bulletin B6353. ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN.

A 1851



**HERE'S ONE** of two highly successful Allis-Chalmers Low-Head Chip Screens that have been operating in a midwest mill since 1936. Pulp and Paper men like the "Low-Head" performance. One reason is that they're getting uniform size, clean chips . . . better control over their cooking cycle . . . a higher quality of pulp!

## BULLETIN!

**HOW TO TAKE A RECONVERSION INVENTORY** of your Centrifugal Pumps, Motors, V-Belt Drives — is subject of A-C's newest help to U. S. industry!

Now being offered *free* to all interested individuals in the Pulp and Paper industry, is a *complete Reconversion Inventory Kit* consisting of — *fact sheets* and *check lists*, together with suggestions for inventory procedure.

**SEND FOR THESE FREE HELPS TODAY!**

**THE NEED.** As equipment becomes more widely available, and as you reconvert toward peacetime production, you may be faced with an unprecedented problem of inventory-taking.

You may have to determine, *more quickly* than such a job has ever been done before, the EXACT CONDITION *of every piece of equipment* you propose to use in peacetime production.

For about 4 years, far greater emphasis has been placed on setting production records than on keeping maintenance records. Condition of equipment is often unknown. And because, during wartime, much equipment has been worked 3 and 4 times as many hours a year as in peacetime, even calendar age may mean nothing.

**STANDARDS HAVE BEEN SET UP** — which apply to *all* makes of equipment — not just A-C's. The Reconversion Kit offers you *standards* which will help you determine which of your units are: (1) okay as is; (2) need new parts; (3) will shortly require replacement; (4) need immediate replacement; (5) need reapplication; (6) are obsolete; or (7) may have parts of second-choice materials dictated by wartime shortages.

**GET YOUR FREE KIT NOW!** For your supply of Reconversion Inventory aids, covering Pumps, Motors and Drives, call your nearby A-C district office or distributor, or write direct to ALLIS-CHALMERS, MILWAUKEE.

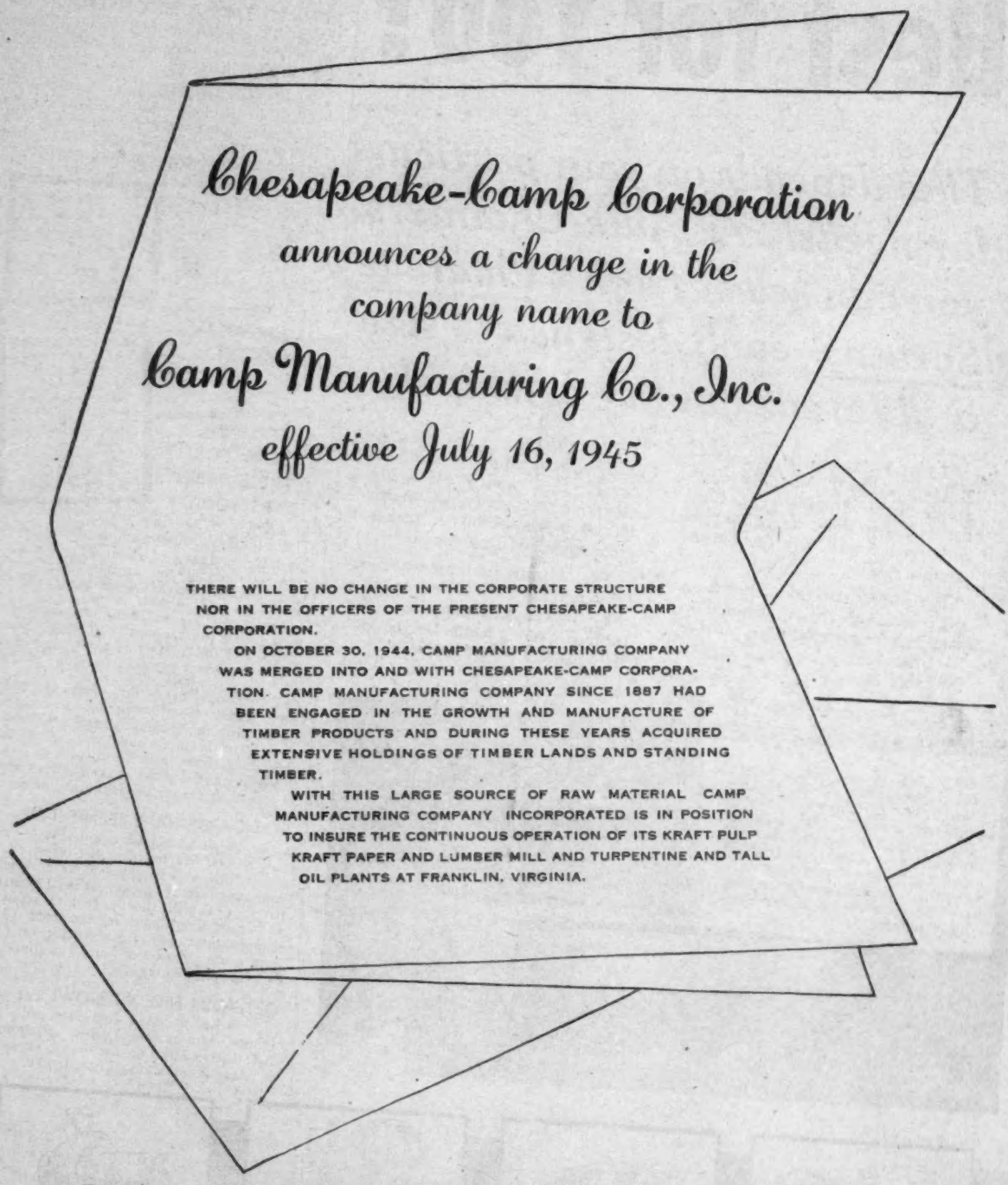
**POWER** — all types of Power Generation, Distribution and Control Equipment.

**MOTORS & CONTROLS** — all types a-c and d-c Motors, ½ to 7000 hp — Gearmotors.

**TEXROPE V-BELT DRIVES** — fractional to 5000 hp — Constant and Adjustable speed.

**PUMPS** — Single & Multi-Stage, 10 to 150,000 gpm — Paper Stock Pumps, Fan Pumps.

# MILWAUKEE 1, WIS.



# Chesapeake-Camp Corporation

announces a change in the company name to

# Camp Manufacturing Co., Inc.

effective July 16, 1945

THERE WILL BE NO CHANGE IN THE CORPORATE STRUCTURE NOR IN THE OFFICERS OF THE PRESENT CHESAPEAKE-CAMP CORPORATION.

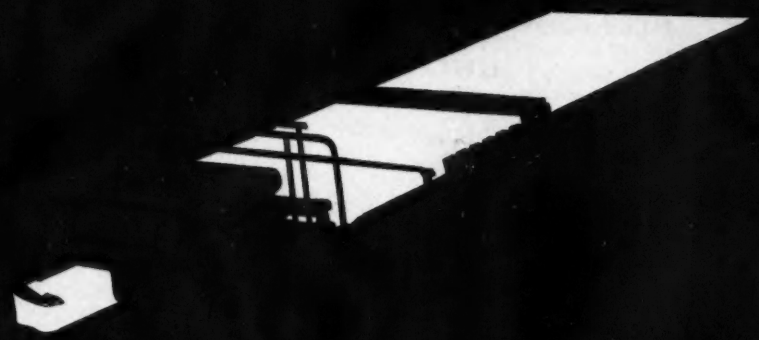
ON OCTOBER 30, 1944, CAMP MANUFACTURING COMPANY WAS MERGED INTO AND WITH CHESAPEAKE-CAMP CORPORATION. CAMP MANUFACTURING COMPANY SINCE 1887 HAD BEEN ENGAGED IN THE GROWTH AND MANUFACTURE OF TIMBER PRODUCTS AND DURING THESE YEARS ACQUIRED EXTENSIVE HOLDINGS OF TIMBER LANDS AND STANDING TIMBER.

WITH THIS LARGE SOURCE OF RAW MATERIAL CAMP MANUFACTURING COMPANY INCORPORATED IS IN POSITION TO INSURE THE CONTINUOUS OPERATION OF ITS KRAFT PULP KRAFT PAPER AND LUMBER MILL AND TURPENTINE AND TALL OIL PLANTS AT FRANKLIN, VIRGINIA.

**CAMP MANUFACTURING CO., INC.**
FRANKLIN . . . . VIRGINIA

ADVENTURES IN THE "MARGIN OF EXPERIENCE"

# Paper Making—



## A BUSINESS THAT BUILDS BUSINESS

Old in years but young in spirit, the paper industry is an outstanding example of what practical and courageous pioneering can do to build business not only for itself but for other industries as well.

New and improved papers are revolutionizing the packaging of hundreds of products ...improving printing processes...making possible more durable wrappings, tags, maps, blueprints, wall coverings. Everywhere paper is being used in new ways.

Serving the paper industry for more than three decades, Niagara has helped to provide that "Margin of Experience" in which such progress is made.

A pioneering organization itself, Niagara has that "Margin of Experience" that means improved service in electro-chemical products.

**Niagara ALKALI COMPANY**

60 EAST 42ND STREET, NEW YORK 17, N. Y.

Caustic Potash • Caustic Soda • Paradichlorobenzene
Carbonate of Potash • Liquid Chlorine • Niathal

## Champion Plans $8 Million Expansion

HAMILTON, Ohio, August 6, 1945—Officials of the Champion Paper & Fibre Co., late last week announced plans for an expansion program to cost between $7,000,000 and $8,000,000 as soon as war and postwar conditions permit. The statement was contained in the annual report received by stockholders.

Logan G. Thomson, president, pointed to the company's strong financial position with current assets increased to $25,456,962 and working capital of $20,904,722. The contemplated improvements, according to Thompson, include the purchase and installation of a new Fourdrinier type paper machine at the Canton (N. C.) mill, expansion and improvement of bleaching and reclaiming facilities at the Houston (Tex.) and Canton mills, conversion of the sulphite pulp process to the bleached sulphate process, and additional power facilities at Canton, also acquisition of additional timber lands, the possible shifting of certain paper-making facilities between mills, and other improvements.

Thomson said that the expenditures, in addition to increasing efficiency of operation, were expected to increase the company's pulp production capacity about 50 tons per day and step up paper and board production approximately 120 tons per day.

## Will Build Mill in New Zealand

New Zealand Forest Products, Ltd., a company with large holdings of planted pine timber in New Zealand, has just appointed the United States Wallboard Machinery Company of New York City to act as contracting engineers in connection with the design of a proposed mill for the manufacture of sulphate pulp, paper and board. David Henry, managing director of the New Zealand company has just left New York after a stay of some weeks.

The New Zealand company expects to make Kraft multiwall sacks, corrugated and solid fiber containers and wrapping papers. It also will probably install equipment for semi and full bleaching of pulp.

A. W. Mackney, chief chemist of the New Zealand company, and F. C. Vaughan, of the Pulp and Paper Division, United States Wallboard Machinery Company, have just returned from Savannah, Georgia where natural color, semi and full bleached pulps, papers and board were made on a semi-commercial scale from logs shipped there from New Zealand.

It is expected now that all preliminary design points will be determined quickly, since many phases such as economics, site, water supply, power, and effluent disposal have been studied extensively by the company's staff since 1939 and the company hopes to receive final proposals by the end of this year.

## Brompton Plans New Mill at Red Rock

PORT ARTHUR, Ont., July 30, 1945—It is expected that operation will commence in the fall of what has become familiarly known throughout the pulp and paper industry as the "Red Rock Mill" of Brompton Pulp and Paper Company, Ltd. The final product, however, will be kraft liner-board, or shipping case materials.

The capacity of the new mill will be 75,000 tons a year. The cost of the entire enterprise is estimated at approximately $8,500,000, including a townsite calling for $500,000 expenditure, pulpwood inventories, and an adequate provision for working capital of about $2,500,000.

## Spend $250,000 on Wolf River Mill

SHAWANO, Wis., August 6, 1945—The Wolf River Paper Company, successor to the Wolf River Paper and Fiber Company in the operation of the mill, announces that it is proceeding satisfactorily in its program of repairs, replacements and improvements. Its schedule calls for an initial expenditure of about $250,000, for such purposes in order to complete plans to serve a market demanding higher grades of paper for more specialized use. Provisions have been made for the use of higher grades of raw material, and several new grades of paper have already been established.

The Great Lakes Paper Sales Corporation, with offices in Chicago and New York, continues as sole sales agent of the mill. John E. Gefaell, long identified with the newsprint, pulp and paper industries is president of both the operating and sales companies. Charles F. Naber, long identified with the Wolf River Paper and Fiber company, is general manager and treasurer of the Wolf River Paper Company and George J. Cooper is secretary. Walter A. Crawford, a paper mill engineer of many years experience and a recognized authority in the manufacture of paper specialties is in charge.

## KVP Spending $4,500,000 at Espanola

ESPANOLA, Ont., August 6, 1945—Reconstruction of the old Spanish River Paper Company's mill by the Kalamazoo Vegetable Parchment Company is being rushed, according to a progress report made by the president, Ralph A. Hayward. Hayward said cost of the project is estimated at $4,500,000.

The property was purchased in January of 1943, and about July of next year, Hayward says, it is expected to be producing about 200 tons of bleached and semi-bleached sulphate pulp daily.

About 40 per cent of the company's pulp will have to be brought from the outside, Hayward pointed out, but Espanola's output will give the parent company much greater control over its supply than has been possible to obtain in the past. The cost of getting Espanola into condition is estimated at about $4,500,000, although the entire enterprise represents an amount considerably more.

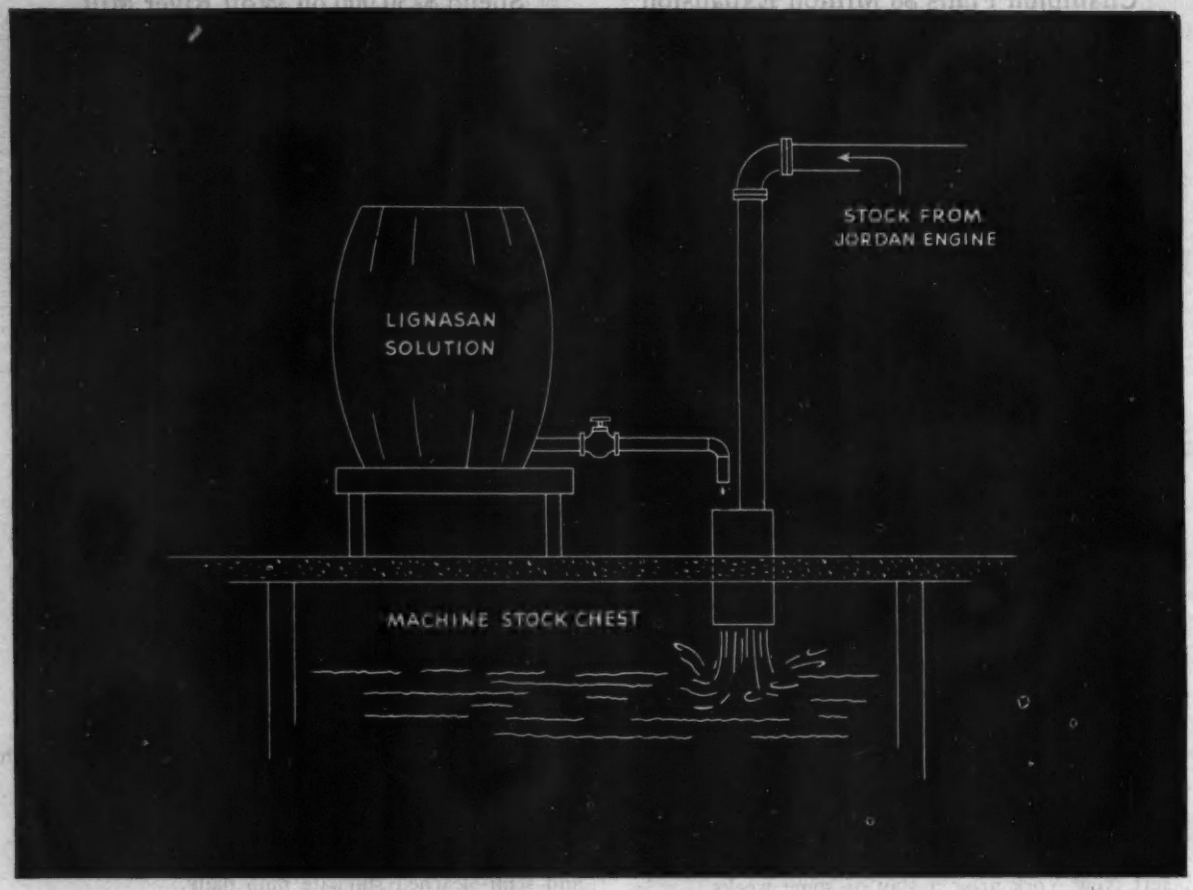
In addition to the mill, KVP will operate woods camps at Cartier, Shean, Sultan and Fingal, all north of Espanola and reached by tributaries of the Spanish river, which flows past the mill and whose falls provide power for the operation.

## Kimberly-Clark Promotes Jenkins, Watt

NEENAH, Wis., July 27, 1945—The Kimberly-Clark Corporation today announced the election of C. F. Jenkins and R. M. Watt as assistant vice-presidents of the company. Mr. Jenkins is general sales manager. Mr. Watt, who is also assistant to the president of Spruce Falls Power and Paper Company, is being transferred to New York where he will be in charge of Kimberly-Clark's eastern division as well.

## Bartram to Add New Wing

VANCOUVER, B. C., August 6, 1945—Bartram Paper Products, Ltd., of this city will build a $200,000 addition to its present plant at Hastings and Woodland Drive, to employ an additional 100 workers, making 180 in all. The new plant will make specialty paper products, while the existing factory continues on kraft paper items.




# Another spot for slime control

FOR PLANTS THAT DO NOT HAVE BEATERS, for mills that depend on hydropulpers and Jordan engines only, the above set-up represents a simple way of adding *slime-controlling* "Lignasan" to stock as it enters the machine stock chest. In essence, the plan merely consists of bleeding "Lignasan" solution into the stream of pulp coming from the Jordans.

"Lignasan" is one of the most powerful bactericides and fungicides known. It is effective even in low concentrations. Approximately 4 ounces per ton of dry fiber usually can be relied upon to prevent slime formation and souring.

When you add "Lignasan" to pulp held in machine stock chests, you not only protect the pulp from souring during extended shutdowns . . . *you make the entire subsequent paper-making operation easier.* By checking the growth of slime-forming organisms, you reduce clogging of pipes, screens and headboxes and materially cut down on the time and labor needed for washups and cleanings.

Many pulp and paper mill operators have credited "Lignasan" with substantial savings. Get the facts today, and learn how "Lignasan" can help *you* curb profit-stealing slime. Write our nearest branch office or E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware.

BE A BLOOD DONOR—SAVE A LIFE

*Controls slime*
*Preserves pulp*

**Du Pont Lignasan**
REG. U. S. PAT. OFF.
BACTERICIDE AND FUNGICIDE

DU PONT
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

# The BROUGHTON S-13 Oscillating Shower

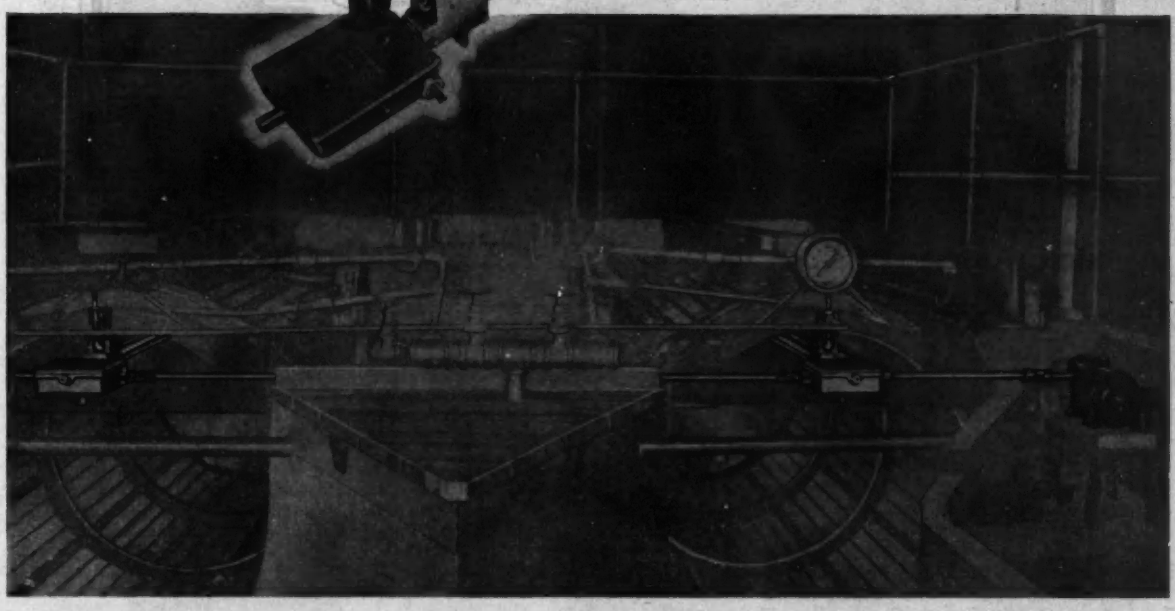
## *effects large savings in water... steam... and operating efficiency of Rotary Screens*

**Requires less than 5 gallons per minute of fresh, filtered water to do a thorough job of continuous cleaning. Savings in many mills approximate 100,000 gallons, and more, of water every 24 hours. Decreases the total white water in circulation and greatly lowers stock and heat losses to the sewer. Eliminates all lodgments above stock level in all types of head box cylindrical screens so that no lumps nor strings can accumulate and drop into the stock. Completely eliminates the use of all pans inside and outside the screens. Helps stock run freer and warmer on wire, resulting in less use of steam for drying. Paper leaving the press section carries less moisture and a higher temperature. Permits running with a wider open screen valve thereby actually increasing capacity of screens with resultant higher speeds, particularly on heavy sheets.**

Pat. Nov. 3, 1942—2300909
May 4, 1943—2318368
(Other Pats. Applied For)

*Also Manufacturers of S-10-XM Showers for Cylinder Molds, Felts, Fourdriniers, etc.*

*Information and Drawings upon request.*



*Broughton Oscillating Showers S-13-XM installed within screens of an Eastern Mill.*

ARMY E NAVY

# A. E. BROUGHTON & COMPANY

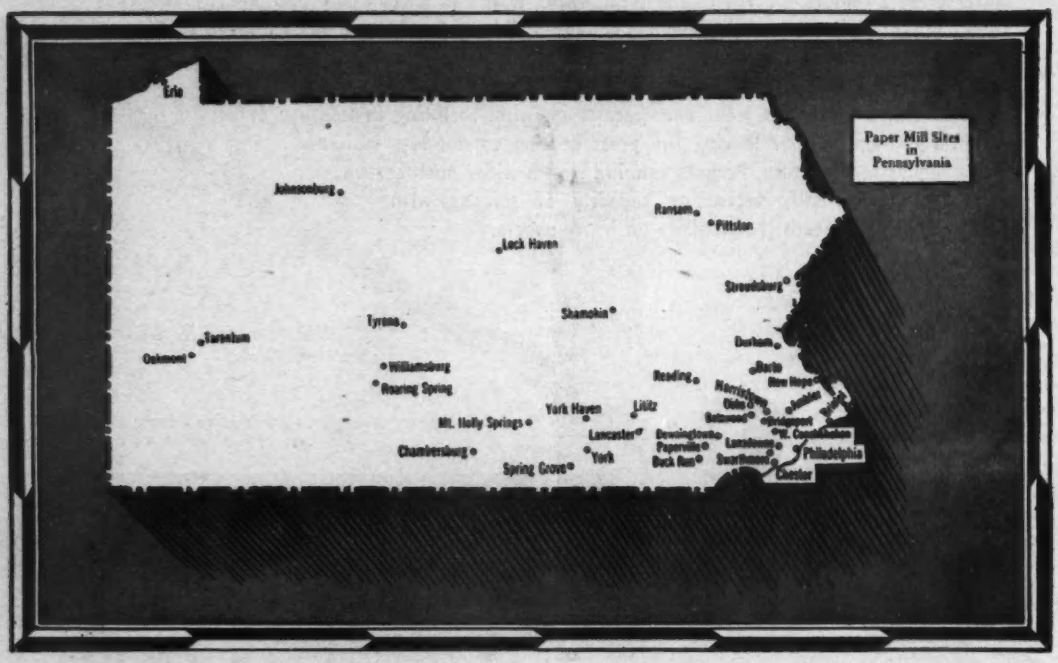
***Manufacturers of mechanically operated Oscillating Showers, and Unit Vacuum Controls for paper machine suction boxes.***

**GLENS FALLS, N. Y.**

# Draper's

# ATLAS OF AMERICAN PAPERMAKING

**No. 9 PUBLISHED BY DRAPER BROTHERS COMPANY • CANTON, MASSACHUSETTS**




*Map copyright by L. D. Post, Inc., New York. American Map Co., N. Y.*

**HIGH LIGHTS:** Pennsylvania, the cradle of American papermaking, is one of the six States in which production of paper nearly reaches, or else surpasses 1,000,000 tons per annum. To have held its important position for more than 300 years, since the establishment of the first American paper mill at Roxborough in 1690, is a fine achievement. The lineal descendant of this pioneer plant now operates as the Dill & Collins Division of the Mead Corporation, in Philadelphia.

Pennsylvania may take pride in three other achievements; the first domestic manufacture of straw paper and soda pulp and the invention of the sulphite process. Colonel William Magaw of Meadville, confided his discovery of straw pulp to G. A. Shryrock, of the Hollywell paper mill near Chambersburg, and production began there in 1829. Hugh Burgess patented his soda pulp process in 1854, and in 1863 began production on a commercial scale with the American Wood Paper Company at Manayunk. Benjamin and Richard Tilghman of Philadelphia invented the sulphite process, and a patent was issued to the former in 1866.

Further evidence of Philadelphia's interest in the paper industry is the existence in the Franklin Museum of a paper exhibit containing a working model of a paper machine. The *Study Course for Paper Salesmen* inaugurated in 1936 by the Paper Trade Association of Philadelphia, in conjunction with members of the Allied Trades and the State College of Pennsylvania, although now in abeyance, is memorable as the only course yet established (except by correspondence) in this important but long neglected field.

Pennsylvania has 57 paper mills and 9 pulp mills; 84 Fourdriniers, 46 cylinder machines, 3 Yankees, 1 wet machine.

*Draper Felts for Efficiency*

DRAPER BROTHERS COMPANY

*Woolen Manufacturers Since 1856*

Canton, Massachusetts

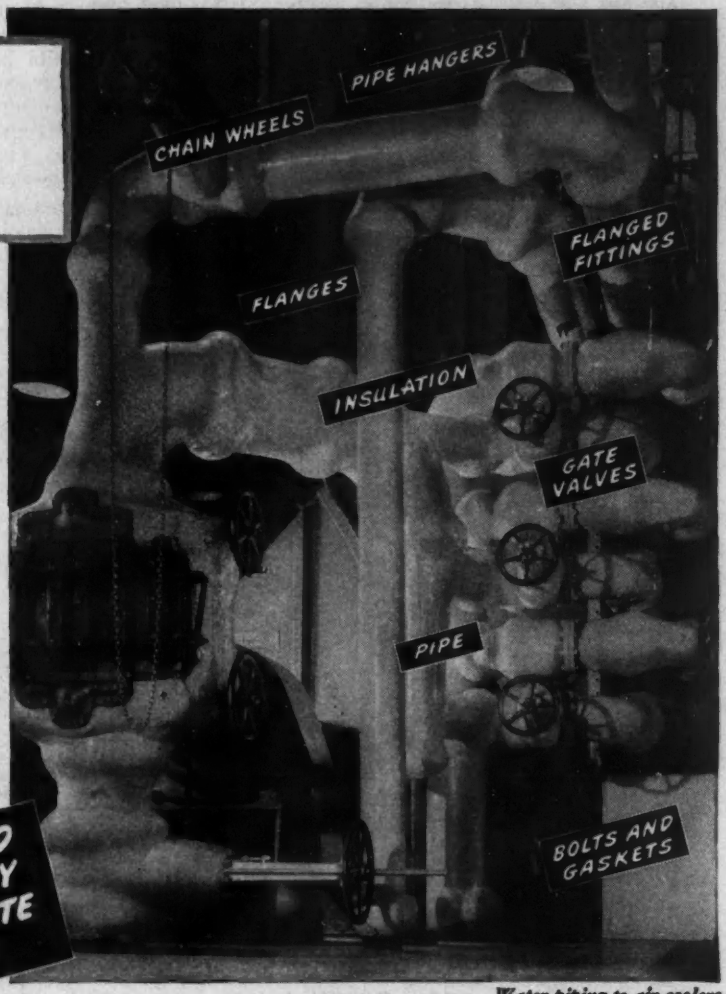
RALPH E. BRIGGS Sales Manager

BRADFORD WEST, PITTSFIELD, MASS. • WILLIAM N. CONNOR Jr, CANTON, MASS. • L. H. BREYFOGLE, KALAMAZOO, MICH. • CHAS. E. BERTSCHY, MILWAUKEE, WIS. • W. L. CAMPBELL, SAVANNAH, GA. • BALFOUR GUTHRIE & CO. Ltd., PACIFIC COAST

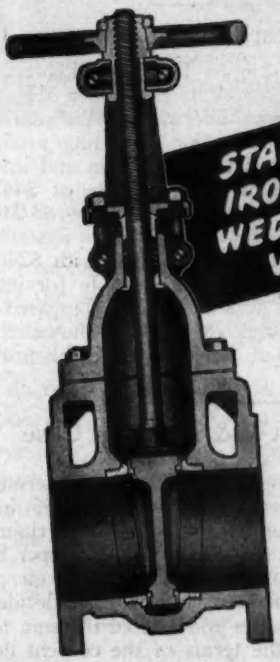
# How the Complete CRANE Line Simplifies Piping Replacement Work

**ONE SOURCE OF SUPPLY**
**ONE RESPONSIBILITY**
**ONE STANDARD OF QUALITY**

The unusual completeness of the Crane line is of distinct advantage in "converting" piping systems. See the service recommendations below for Standard Iron Body Gate Valves. Here's a typical Crane solution to many deferred valve replacements. Your Crane Branch or Wholesaler supplies all your piping requirements from the world's greatest selection in brass, iron, and steel equipment. One standard of quality in all materials and one responsibility for them help insure the best installations. Crane Co.'s 90-year manufacturing experience insures long-lasting dependability.




*Water piping to air coolers*




***SERVICE RECOMMENDATIONS:*** **Crane Standard Iron Body Wedge Gate Valves are suited for many services in factories and power plants, at all working pressures up to 125 pounds steam. Brass trimmed valves are recommended for steam, water or oil lines; all-iron valves for oil, gas or fluids that corrode brass but not iron. Made in O.S.&Y. and Non-Rising Stem patterns. See page 101 of your Crane Catalog.**

**Working Pressures**

| Size of Valve | Screwed or Flanged End Valves | | Hub End Valves |
|---|---|---|---|
| | Saturated Steam | Cold Water, Oil or Gas, Non-Shock | Cold Water or Gas Non-Shock |
| 2 to 12 in. | 125 pounds | 200 pounds | 200 pounds |
| 14 and 16 in. | 125 pounds | 150 pounds | 150 pounds |
| 18 to 24 in. | * | 150 pounds | 150 pounds |

*For steam lines larger than 16-in., Crane 150-Pound Cast Steel Gate Valves are recommended. (For sizes under 2-in., use Crane Clamp Gate Valves.)

**CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Ill. •** ***Branches and Wholesalers Serving All Industrial Areas***

# CRANE

**VALVES • FITTINGS • PIPE**
**PLUMBING • HEATING • PUMPS**

# FINANCIAL NEWS

### New York Stock Exchange

High, Low and Last for Week Ending August 4, 1945

STOCKS

| | High | Low | Last |
|---|---|---|---|
| A. P. W. | 6¼ | 5⅞ | 5⅞ |
| Armstrong Cork Co. | 43¾ | 42¾ | 43⅜ |
| Celotex Corp. | 16⅜ | 15⅞ | 16 |
| Celotex Corp., pf. | 21 | 20¼ | 20¼ |
| Certain-Teed Products Corp. | 11¾ | 10½ | 11¼ |
| Certain-Teed Products Corp., pf. | 164 | 158 | 164 |
| Champion Paper & Fibre Co. | 33 | 32½ | 33 |
| Champion Paper & Fibre Co., pf. | ... | ... | ... |
| Congoleum Nairn Co. | 29¼ | 29 | 29 |
| Container Corp. of America | 29½ | 28 | 29 |
| Continental-Diamond Fibre Co. | 12½ | 12¼ | 12⅜ |
| Crown-Zellerbach Co. | 22⅜ | 21⅞ | 22⅜ |
| Crown-Zellerbach Co., pf. | 104 | 103¾ | 103¾ |
| Dixie Cup Co. | 26 | 26 | 26 |
| Dixie Cup Co.—A | 49 | 49 | 49 |
| Flintkote Co. | 28⅝ | 27½ | 28 |
| Flintkote Co., pf. | 109 | 109 | 109 |
| Robert Gair | 6¼ | 6 | 6¼ |
| Robert Gair, pf. | 17¾ | 17¾ | 17¾ |
| International Paper Co. | 25⅛ | 24⅞ | 25⅛ |
| International Paper Co., pf. | 99 | 95⅞ | 99 |
| Johns-Manville Corp. | 115½ | 113½ | 114¾ |
| Johns-Manville Corp., pf. | ... | ... | ... |
| Kimberly-Clark Corp. | 46¾ | 46 | 46 |
| Mac Andrews & Forbes | ... | ... | ... |
| Mac Andrews & Forbes, pf. | 154½ | 154 | 154½ |
| Masonite Corp. | 42 | 41½ | 41¾ |
| Mead Corp. | 15⅛ | 14⅞ | 15 |
| Mead Corp., pf. A—6% | 105½ | 105½ | 105½ |
| Mead Corp., pf. B—5½ | 103½ | 103½ | 103½ |
| National Container Corp. | 15 | 14¾ | 14¾ |
| Paraffine Companies, Inc. | 63½ | 62 | 63½ |
| Paraffine Companies, Inc., pf. | 110 | 109½ | 109½ |
| Rayonier, Inc. | 19½ | 18¾ | 19½ |
| Rayonier, Inc., pf. | 36¾ | 35½ | 36¾ |
| Ruberoid Co. | 36¼ | 36 | 36¼ |
| Scott Paper Co. | 50 | 50 | 50 |
| Scott Paper Co., pf. | 111¾ | 111¾ | 111¾ |
| Sutherland Paper Co. | ... | ... | ... |
| Union Bag & Paper Corp. | 17¾ | 16⅞ | 17¼ |
| United Paperboard Co. | 7⅛ | 7⅛ | 7⅛ |
| U. S. Gypsum Co. | 88¼ | 86½ | 87 |
| U. S. Gypsum Co., pf. | ... | ... | ... |
| West Virginia Pulp & Paper Co. | 28¼ | 28 | 28 |
| West Virginia Pulp & Paper Co., pf. | 112 | 112 | 112 |

BONDS

| | | | |
|---|---|---|---|
| Abitibi Pulp & Paper Co. 5s '53 | 100½ | 100½ | 100½ |
| Celotex Corp. 3¾s '55 | ... | ... | ... |
| Certain-Teed Products Corp. 5½s '48 | ... | ... | ... |
| Champion Paper & Fibre Co. 4¾s '50 | ... | ... | ... |
| International Paper Co. 6s '55 | 108¾ | 108½ | 108½ |
| International Paper Co. 5s '47 | 104½ | 104¾ | 104¼ |
| Mead Corp. 3⅛s '53 | ... | ... | ... |

### New York Curb Exchange

High, Low and Last for Week Ending August 4, 1945

STOCKS

| | High | Low | Last |
|---|---|---|---|
| Great Northern Paper Co. | 39½ | 38¾ | 38¾ |
| Hummel-Ross Fibre Corp. | 8⅛ | 8⅛ | 8⅛ |
| St. Regis Paper Co. | 7 | 6⅝ | 7 |
| St. Regis Paper Co., pf. | ... | ... | ... |
| Taggart Corp. | 6 | 6 | 6 |

BONDS

| | | | |
|---|---|---|---|
| American Writing Paper Co. 6s '61 | 101¾ | 101¾ | 101¾ |

## Dennison Net Off Slightly

In a message to stockholders, President Henry S. Dennison of the Dennison Manufacturing Co., reports that consolidated sales of the company for the six months ended June 30, 1945 were $9,625,000 compared with $9,244,000 for the corresponding period of last year.

Consolidated earnings after taxes are estimated at $356,000 this year for the six months compared with a revised figure of $362,000 for the first six months of 1944.

## Gair Declares Preferred Dividend

At a meeting of the Board of Directors of Robert Gair Company, Inc., held on July 24, 1945, a quarterly dividend (No. 19) of thirty cents (30c) per share in respect of the third quarter of the year 1945 was declared on the Preferred Stock of the par value of $20 per share of the Company, payable September 29, 1945 to stockholders of record at the close of business on September 12, 1945.

## Abitibi Reorganization Progresses

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 6, 1945—Shareholders of Abitibi Power and Paper Company are about to be notified of an order issued by the Supreme Court of Ontario calling meetings of securities holders to consider the plan of reorganization. The meetings are to be held on October 4, 5, 8 and 10, it is expected.

With the dates of the meetings expected, trading in Abitibi bonds has been quite active lately. In particular, interest has been widespread in the arbitrating opportunity between the old 5% bonds due 1953 and the new 5% bonds due 1965.

Speculating on what Abitibi's 1944 results would mean in terms of the proposed reorganization, the Financial Post points out that on the basis of 1944 depreciation and depletion Abitibi would have $5,531,055 left to meet $2,946,700 of interest on new funded debt (including 11% extra for payment in U. S. funds).

In other words, interest charges would be met 1.88 times, even after allowing $4,000,000 for depreciation. After 1944 taxes, there would be $1,334,355 as net profit.

New $2.50 dividend shares, replacing 7% preferred shares will—if, as and when—require only $125,000 a year for servicing and the $1,224,355 left after interest charges would be more than 10 times coverage.

With the $1.50 preferred shares replacing the 6% preferred shares entitled to $2,092,908 per annum, after a time, earnings would be $883,553 short of breaking even before reaching the common shares. These estimates, of course, are based on 1944 figures for taxes, depreciation, etc., which will almost certainly be altered.

## Bowater's Profits Up

MONTREAL, Que., August 1, 1945—The report of Bowater's Newfoundland Pulp and Paper Mills Limited, Cornerbrook, Newfoundland, for the year 1944, just received here, shows that operating profit for the year, before depreciation, depletion and interest, was $2,568,946. This was an increase of $441,598 over 1943 and the best reported since $3,031,671 shown for 1941.

Net profit was $711,508 compared with $248,355. After depreciation the balance available for interest from operating profit was $1,725,785 compared with $1,279,543. Net working capital was shown at $8,358,242 an increase of $625,125 over the previous year end.

## Damages in J. & L. Paper Case

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., August 6, 1945—Announcement is made that the government gains $1,601.55 in the settlement of an administrator's consumer claim for treble damages in the case of the J. & L. Paper Products, of this city for over-ceiling prices on paper products. The complainant in the case decided to accept the treble damages and offered the sum to the government. Under the terms of the consent degree and stipulation filed in court the company and its agents are permanently enjoined from buying or selling any commodities at prices in excess of those established. Officers of the firm include Ida Jaffee, president; Samuel Jaffee, vice president, and Herman Jaffee, treasurer.

# *Get high wet strength plus improved rosin retention by beater addition of*

# UFORMITE 467

IF you want to produce paper of high wet strength at minimum cost and without change in your present papermaking process, UFORMITE 467 is the answer. Wet strength equivalent to 25 to 45% of the dry strength can be obtained by simply adding 1 to 3% of this urea formaldehyde resin to the stock in the beater, chest, fan pump or head box. No aging or pre-treatment is necessary before use—UFORMITE 467 is ready for immediate addition to the stock as supplied. Dry strength, as measured by tensile and Mullen, may be increased from 10 to 20%, and fold from 30 to 100%, as proved by laboratory tests.

In addition, UFORMITE 467 improves the efficiency and uniformity of rosin sizing. As little as 0.5% resin on dry fibre weight will permit an appreciable reduction in rosin size requirements, thereby making the most of limited rosin quotas. Improved retention of clays, pigments, waxes and other beater additives as well, may be obtained by beater application with UFORMITE 467.

Testing samples are available, and our technical staff will be glad to assist you in using UFORMITE 467 to best advantage.

*UFORMITE is a trade-mark, Reg. U. S. Pat. Off.*

Represented by Cia. Rohm y Haas, S.R.L., Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities.

## THE RESINOUS PRODUCTS & CHEMICAL COMPANY

*WASHINGTON SQUARE, PHILADELPHIA 5, PA.*

## Paper Mills in Europe Unproductive

WASHINGTON, D. C., August 1, 1945—There has been an almost complete breakdown of the pulp and paper industry throughout western Europe, and the United States cannot count on receiving any pulp or paper at all from that area in the near future, with the exception of pulp from Sweden, Arthur Bevan, chief of the Paper, Lumber and Containers Section of the Foreign Economic Administration, told the Paper Advisory Committee on Exports at a meeting held Thursday in Washington. Lack of coal—which has been termed the number one need for the recovery and rehabilitation of Europe—is probably the chief reason why paper cannot be either produced or transported at levels anywhere near those of the pre-war years, Mr. Bevan said.

Sweden is the primary source of pulp supply for the western European nations, but even Sweden is having great difficulty. Substantial shipments of certain types of pulp from Sweden already have begun to arrive in this country, however, and will continue at least until the stocks that were available in that country are used up. Sweden's main difficulty is that she is short of coal and has had to use more and more wood for fuel, and this, of course, has curtailed her pulp production, Mr. Bevan said. Usually, only 7 to 10% of Sweden's wood production is used for fuel, but last year she used 43%, and this year, if the coal situation continues critical, may have to use more than 50%.

French production is negligible, since France's coal situation is so desperate she is not allocating any coal for paper mills. There are several mills that use water power, but because of the transportation situation the French are not using transportation facilities to move the production of these mills.

Much the same picture holds in Belgium, except that she has allocated 6,000 tons of coal a month for the paper mills. This Belgian paper, however, will be used exclusively by the Allied armies for redeployment.

Pulp and paper production is also negligible in the Netherlands. In that country not only is the transportation situation chaotic, but also some of its largest mills have been destroyed.

In Germany, pulp and paper mills were not prime targets during the war, and, therefore, there are many left. There is also plenty of wood. It has not yet been decided what Allied policy will be with regard to the restoration or resumption of the German pulp and paper industry.

Rounding out the picture, Mr. Bevan said that in Norway most of the mills are intact, but there is little wood available at these mills. This is because all during the German occupation, Norwegian woodsmen seized every opportunity to sabotage German wood procurement from their forests, he said. It will not be possible to move very much wood out of the forests now until the snows come again. In Poland, almost all the mills apparently have been destroyed. Great Britain, whose consumption has been on a level of 25% of pre-war years, hopes that pulp shipments from Sweden will permit her to raise this to 50%.

## Henderson Heads Brown Towel Sales

BOSTON, Mass., August 6, 1945—The Brown Company has announced the resignation, effective August 15, of John H. Leo, who for many years has been sales manager of the towel division. He will be succeeded by Gilford F. Henderson, who will also continue as sales manager of the paper division.


KENNEDY
BRONZE GATE VALVES

*Simple*
*Sturdy Durable*

**Assure easy operation, and lastingly trouble-free service. Available in non-rising and rising stem types; also outside screw and yoke. Built for steam pressures up to 300 lbs.**

***Buy From Our Distributor***

**Figure 27**
**Standard**
**Screwed Ends**

THE KENNEDY VALVE MFG. CO., ELMIRA, N. Y.

## Glidden Promotes Two

CLEVELAND, Ohio, August 6, 1945—Reorganizing the Chemical and Pigment Division of the Glidden Company, general headquarters, Cleveland, W. J. O'Brien, vice-president, who recently assumed administrative charge of the division, has announced two important promotions.

J. H. Lathe, western general sales manager, adds to his responsibilities sales management of the Central Division. Joining the Gliddon organization in 1919, Mr. Lathe returned to Glidden after serving in World War I to become Sales Manager of its Forest City Paint and Varnish Company. Later, he became head of the Glidden Industrial Sales Division. Mr. Lathe will have his headquarters in Cleveland and report directly to Mr. O'Brien.

C. P. Engelsman has been appointed Assistant General Sales Manager of the Chemical and Pigment Division. Mr. Engelsman, who has been responsible for white lead sales in the Middle Western territory and for white pigment promotion, now takes over general charge of Glidden's white lead operations and sales. He will also aid Mr. O'Brien in miscellaneous correspondence involving domestic and export sales, reports, statistics, etc.

## Cyanamid Tells of Melamine

A 24-page illustrated booklet describing the many applications of the chemical melamine, in the plastics, textile, paper, leather, chemical, paint and allied industries, has been published by the American Cyanamid Company, which was the first company to recognize the tremendous possibilities in melamine and to make it available to American industry on a commercial scale. The booklet is designed for popular appeal and supplements the numerous technical publications relating to the various applications of melamine and the chemical compounds in which it is used.

## Seybold Joins Lawson

The E. P. Lawson Company announces the appointment of Fred W. Seybold as chief designing engineer for the production of paper cutting machinery that will be offered under the Lawson trademark.

Mr. Seybold, an authority in this field, became interested in machine design when he went to work in 1916 for his uncle, Charles Seybold, the founder of the Seybold Machine Company. He is a graduate of Ohio State University and holds the degree of Bachelor of Mechanical Engineering. In 1933 the professional degree of mechanical engineer was conferred upon him by his alma mater.

## Monsanto Asks Seizure

ST. LOUIS, Mo., August, 1945—Monsanto Chemical Company today invited the Federal government to take over operation of its strike-bound Monsanto, Ill., plant to insure production of vital war-needed chemicals for the army and navy. In a telegram to President Truman, the company said it was unable to keep the plant operating in the face of "flagrant union irresponsibility".

The big chemical plant at Monsanto, Illinois, has been closed down since July 26 when approximately 45 pipe fitters walked out in a jurisdictional dispute with the iron workers and immediately established a picket line around the company's gates. Approximately 1,200 workers were thrown out of employment.

In the telegram to President Truman, the company said it had signed annual contracts with the Chemical Workers Union of the A. F. of L. since 1937 calling for no strikes and no lockouts. "The company has scrupulously observed the spirit as well as the letter of these contracts," the telegram said. "Despite these signed agreements, however, there have been in the past 21 months 15 work stoppages at this plant, every one of which has been a breach of contract." Picketers have refused entry to the maintenance men and will not even allow the plant management to enter the premises, the President was told. No demands have been made on the company in the present dispute, the telegram said. "Instead", the President was told, "it is purely a dispute within union ranks which only the union can settle and only action by the union itself can bring the men back to work. This flagrant disregard by the union for the terms of their contract and for the demands of the war program leaves us but one alternative. We respectfully request you to take over this plant in the name of the United States Government in order to bring about the immediate resumption of work on materials which the armed services are calling on us to furnish."

The telegram admitted that "This is no easy decision or request for us to make. We prefer to manage and operate our own plants in keeping with the traditional spirit of private enterprise but we know the urgent need for our products and are determined that they shall be made available, even at the cost of loss of control of our plant."

Whether it's changing machine parts, lifting heavy work, shifting boxes, bales, drums, cartons or crates, one man can do the job faster and easier with a Reading Hoist.

For speed in lifting and accuracy in stopping the load, the Multiple Gear Chain Hoist should be selected. Positive and accurate braking holds the load at the desired height with complete safety.

Easy operation is assured by the oil bath in which the operating gears are sealed plus the ball bearing load wheel. Sizes are available for loads of from ¼ ton to 25 tons. Suspensions include hook, trolley and post types.

For help on materials handling problems, consult your Reading Hoist distributor or write to us direct.

READING CHAIN & BLOCK CORPORATION
2113 ADAMS ST., READING, PA.

CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

READING HOISTS

## Minerva Staff Turns Out at Picnic

MINERVA, Ohio, August 1, 1945—The annual picnic of Minerva Wax Paper employees was held at Taylor Lake on the afternoon and evening of July 28th. An unusually large attendance was reported. The afternoon was filled in with sports, and after a picnic dinner, dancing was enjoyed until midnight. Chester W. Mitchell was in charge of arrangements, and together with the help of his committee provided an unusually fine and interesting program.

Attractive Service buttons were awarded to a number of workers, who had been employed by the company between 25 and 5 years. Mr. John Hoover, Sheeter operator, received a gold diamond-studded button for 25 years of service. Mr. Hoover has been with the company since its inception. Chairman R. G. Hathorn presented with appropriate remarks, a button covering over 20 years of service to the President of the company, Mr. Alva F. Gluck. Mr. Gluck then presented buttons to many other employees as follows:

For 20 years: R. C. McCaskey, Vice President: W. L. Hogue, Vice President; E. L. McConney.

For 15 years: L. Amos; Erna Hunter; L. Slagle; F. Unkefer; G. Hawkins; Hazel Dumbleton; W. Murphy; M. Wyss; C. Mitchell; E. Walter; F. C. Gluck; E. Manfull; W. Syme; Elsie Bailey.

For 10 years: D. Vujasinovic; G. Sells; C. Hill; V. Gray; S. Strachan; K. Ray; C. Harsh; Bessie Danner; R. Jones; H. Lanning; A. Elliott.

For 5 years: Charlyne Carr; C. Paxton; A. L. Patmore; Jennie Bonardi; Viola Leyda; D. Waefler; Mildred Sponseller; Fayme Hahlen; Olive Keister; C. Hoopes; D. Haynam; H. Starkey; Verna Roach.

The employees expressed their gratification for this recognition. Similar awards will be made each year, based on each 5 years of service.

## Bartlett Celebrates 60th Anniversary

EAST WALPOLE, Mass., August 6, 1945—In the 150th anniversary year of Bird & Son, Inc., Elmer H. Bartlett on July 25 celebrated his 60th anniversary with the firm. Putting in his usual day at his desk and requesting no formal recognition of the occasion, he received hundreds of congratulatory messages and a silver paper knife inscribed as the gift of the board of directors.

Bartlett started to work for the company in 1885 as the sole office clerk, later filling positions of timekeeper, paymaster, bookkeeper, order clerk, sales manager, and head of the special papers division. He retired in 1935 as vice-president and has since been a member of the executive committee and the board of directors.

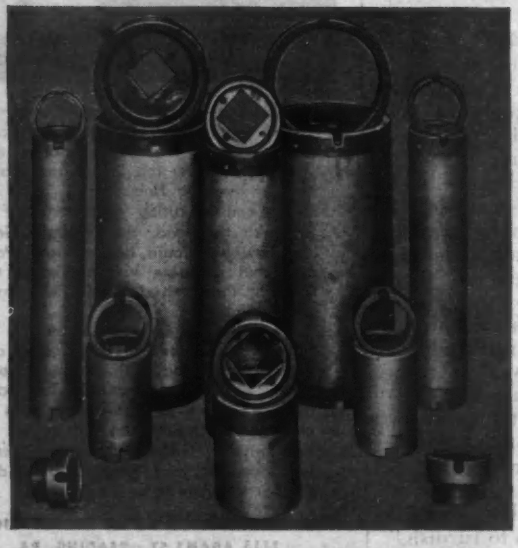
## Scott Adds to Preston's Duties

G. Davies Preston, assistant to the retail sales manager, will become sales personnel manager of Scott Paper Company on September 1. Included in his duties will be the direction of a training program for Scott's active sales organization and for servicemen returning to that branch of the business.

Preston joined the company in 1934 as a member of the quality control department.

## Marathon Names Graf in North Carolina

Marathon Corporation, Menasha, Wisc., announces the appointment of Erwin F. Graf, Jr., as representative for the Jobber Sales Division in the North Carolina territory. Mr. Graf has had several years experience in the wholesale grocery field in Michigan and Wisconson, most recently as a representative of Plumb and Nelson Company, Manitowoc, Wisc.

ELIXMAN

CAPS

Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.

CORES

Samples of caps or cores will be gladly submitted

ELIXMAN PAPER CORE COMPANY, INC.

CORINTH, N. Y.

# CONVERTIBLE FREE-VANE CONTROLLERS MEET YOUR AUTOMATIC CONTROL REQUIREMENTS

**A Specific Instrument for Any One of Eight Variables:**

- temperature
- flow
- liquid level
- pressure
- draft
- humidity
- pH value
- time

*Convertible:* Bristol's air-operated Free-Vane Controllers, available in the following types, each easily converted to another type simply by replacing one unit:

*Monoset* — for simple process-control applications where a valve is to be opened or closed with a small change in the value of the quantity under control.

*Ampliset* — has a variable throttling range, easily adjusted, and is used on continuous processes where the flow through the valve changes only a moderate amount in maintaining constant results.

*Preset* — throttling type, with a corrective action proportional to rate at which controlled variable is changing. Used mainly on batch processes having considerable lag, where starting up and shutting down occur frequently.

*Reset* — has throttling and automatic reset adjustments. For processes where transportation and transfer lags are large in relation to the capacity lag and where a considerable change in flow is required in maintaining constant conditions.

*Magniset* — the corrective action of the Preset mechanism is applied to the Reset Controller to correct for sudden and excessive load changes.

### More Accurate Controlling Due to Bristol's "Free-Vane"

As the sensitive high-torque measuring element rotates under the activation of the change in value, a thin vane, floating between two opposing jets of air produces the throttling action to operate the control mechanism. Since the "Free-Vane" is frictionless, there is no retarding action on the measuring element — and recording is absolutely true. This is a Bristol patented feature, described in further detail in Bulletin A-112.

For a free copy, address THE BRISTOL COMPANY, 159 Bristol Road, Waterbury 91, Conn. The Bristol Company of Canada, Ltd., Toronto, Ontario. Bristol's Instrument Co., Ltd., London N.W. 10, England.

*Engineers process control for better products and profits*

**AUTOMATIC CONTROLLING AND RECORDING INSTRUMENTS**

## Obituary

### Walter Gilbert Lees

Walter Gilbert Lees, formerly of Brookline, Mass., died August 2 at the Cape Cod Hospital after an illness of several weeks. Private funeral services were held at noon, in Woodlawn cemetery, Wellesley, Mass.

He was born in Everett, Mass. and for many years was associated with the firm of Hollingsworth & Whitney, paper manufacturers of Boston and Waterville, Me.

Well known in tennis circles, he formally was a member of the Longwood Cricket Club and The Country Club, both of Brookline.

He leaves a widow, Mrs. Elizabeth Jackman Lees; a daughter, Mrs. George K. Campbell of Chicago; two grandchildren and a sister, Mrs. Harry B. Williams of Newton.

## Hercules Opens Milwaukee Office

L. E. Fitzgerald, who has supervised paper mill sales and technical service in the Milwaukee territory for the past 11 years, has been named resident manager at Milwaukee, Hercules Powder Company announced today. The office at Milwaukee will be expanded into a fully staffed branch office. The staff will be augmented to meet increased demands coming from the Milwaukee territory which includes Wisconsin, Minnesota, and the northern peninsula of Michigan.

The headquarters of the newly established district sales office will be located at 5228 N. Hopkins Street, Milwaukee, where the company has a plant manufacturing rosin size and emulsions.


**HARDER SIZED PAPER**

**can be produced**

**with**

**LESS ROSIN**

**and**

**WITHOUT THE USE OF EXTENDERS OR SUBSTITUTES**

**This NEW METHOD available on an Engineering Basis**

**J. A. DeCEW** 9. W. Prospect Ave.
MT. VERNON, N. Y.


## PAPER SUPPLY OUTLOOK UNCERTAIN

In commenting upon recent optimistic statements from official sources with respect to the paper supply outlook, E. W. Tinker, Executive Secretary of the American Paper and Pulp Association, cautioned that there is need for realistic recognition of all the factors involved and predicted that considerable time will elapse atfer V-J Day before the situation in the paper industry will adjust itself to a point obviating the necessity for the continuation of maximum production, particularly of fibrous raw material upon which the industry is dependent. Any optimism at this time, he said is unfortunate and unjustified.

He stated that the prospects for a limited supply of imported pulp have naturally been received with great enthusiasm by paper manufacturers who have been exhausting every resource to maintain an adequate supply for the essential economy and military requirements. However, Mr. Tinker emphasized the fact that the amount of imported pulp that would probably be received would be absorbed without an appreciable effect on overall production. Some increase in quality might be apparent, but from a tonnage standpoint, the effect would be negligible.

The situation with respect to woods labor is still depreciating and, the War Department plan to withdraw prisoners of war, who, particularly in the South, are a major factor in wood production, is viewed with great alarm by paper manufacturers. A feeling of lack of urgency brought on by V-E Day might easily limit farmer-produced wood supplies, which comprise 30% of the total wood used by the industry, to a point that would result in further curtailment of pulp production from domestic sources. Mr. Tinker went on to say that any relaxation in the national campaign to salvage all available waste paper would be a tragic mistake at this time. The successful campaigns to stimulate wood production and salvage programs have been the major achievements that have enabled the industry to meet its obligations for essential products, both to the war and the civilian economy. Mr. Tinker emphasized that statistics meant little in a situation so dependent upon indeterminate factors, involving a high degree of cooperative effort between public and private agencies.

## Casein Output Off in June

WASHINGTON, D. C., August 6, 1945—The Department of Agriculture has announced that production of dry casein in June again fell below that of a year earlier.

Following an increase of 22% in May over the same month the previous year, June, 1945 production dropped 6% from the level of June last year.

Stocks of casein held by domestic producers on June 30, 1945, including some that was imported, increased 7% over the the stocks held on the same date last year, the Department stated.

## Reliance Promotes Harrell and Taylor

CLEVELAND, July 30, 1945—Promotions in top personnel of the Reliance Electric & Engineering Company, 1088 Ivanhoe Road, are announced by James W. Corey, president. Fred E. Harrell, chief engineer for the past two years, has been appointed general works manager, succeeding S. B. Taylor, who has resigned as manufacturing vice president but will remain a member of the Board of Directors. William R. Hough, product development engineer, has been named chief engineer succeeding Harrell.

## Goodyear to Build Vinyl Plant

AKRON, Ohio, July 30, 1945—Construction of a vinyl plastics plant at Niagara Falls, New York by The Goodyear Tire & Rubber Company for the manufacture of a group of plastics made from acetylene derived from lime and coke will begin shortly.

The new plant's product which will be used in the manufacture of transparent packaging film, for wire insulation, fabric coatings, flooring, wall coverings and adhesives, will be shipped to other plants for processing. Current production capacity is expected to be three million pounds per year.

Built with cement block and steel in chemical utility type construction, the new plant will be in several buildings on eleven and a half acres bordered by Baker and Charles streets and near Fifty-sixth Street.

Erection of the plant is scheduled to begin the middle of August and about six months will be required for completion, including installation of equipment, Goodyear engineers said. About 50 persons will be employed when the plant starts operation.

The factory was formerly scheduled for construction at Natrium, W. Va., but was moved to New York because of the convenient availability of raw materials and lower cost of plant investment.

## Gordon Biesenthal Joins Fleck, Ltd.

OTTAWA, Ont., July 30, 1945—C. Gordon Biesenthal has joined Alexander Fleck, Limited, as chief engineer. Mr. Biesenthal has had a wide experience in the paper industry in the Dominion, having been associated with Canadian International, Spruce Falls Power and Paper, J. R. Booth, Limited, and the E. B. Eddy Company. He holds a degree from Queen's University at Kingston, Ontario, and is also active in engineering society work.

Working with Alexander Fleck Limited, Mr. Biesenthal's contribution to paper mill engineering should be of substantial proportions, and particularly helpful to Canadian mills.

## Heppenstall Appoints Ralph Carson

PITTSBURGH, August 3, 1945—Ralph K. Carson has been appointed sales engineer at the Detroit branch of the Heppenstall Company by L. A. Daines, vice president and general sales manager. For several years Mr. Carson has been a member of the engineering department of the Kelsey-Hayes Wheel Company, Detroit, and was previously associated in sales and manufacturing capacities with Pittsburgh-Crucible Steel Company and Bethlehem Steel Company.

He succeeds James C. Patton, Jr., who recently becames District Sales Representative for the Heppenstall Company in Chicago.

## Chromium Corp. Promotes Old Timers

Ralph E. Cleveland, Waterbury plant manager, and Henderson M. Bell, Cleveland plant manager, of the Chromium Corporation of America have been elected vice-presidents. Donald H. Bissell, secretary of the corporation, has been appointed Chicago district manager. John B. Allen, eastern sales representative, has been transferred to Chicago as sales manager.

The Chicago plant superintendent is Rolland A. Rahe. Each one of these officials has been associated with Chromium Corporation of America for more than 17 years in connection with the company's industrial chromium plating and engineering services.

## Wyandotte Names Roderick to Sales

Howard F. Roderick, former director of research of Wyandotte Chemicals Corporation, is now assigned to special sales work on various grades of Wyandotte Calcium Carbonate.

Mr. Roderick did the pioneering chemical and development work which resulted in the manufacture of special calcium carbonates by the former Michigan Alkali Company which he joined in 1931. He is thoroughly informed of the needs of the paper, rubber, food and pharmaceutical industries for special carbonates—both from a chemical and a production standpoint. His transfer to the sales department coincides with the breaking of ground for a new carbonate plant by Wyandotte Chemicals which will increase their production 50%. Completion of the new plant is expected early in the spring of 1946.

Dr. Thomas H. Vaughn, assistant director of research for the past six years, will replace Mr. Roderick. Dr. Vaughn formerly headed the Organic Division of Union Carbon and Carbide Research Laboratories. In his new position Mr. Roderick will act under the direction of Bert Cremers, vice-president in charge of sales, Michigan Alkali Division.

## Worthington Advances Feldbush

HARRISON, N. J., July 30, 1945—Harry A. Feldbush, formerly works manager of the Holyoke, Mass. plant of Worthington Pump and Machinery Corporation has been named vice-president in charge of engineering for the entire corporation. His duties cover engineering activities of all works and domestic subsidiary companies. His headquarters will be at the general offices.

Ralph M. Watson, formerly chief engineer of the centrifugal engineering division has been appointed assistant to Mr. Feldbush.

## Ohlson Joins Pennsylvania Salt

John E. Ohlson, Ch.E., formerly with Wyeth, Incorporated, has been appointed senior chemical engineer of the Pennsylvania Salt Manufacturing Company, Philadelphia, Pa., by F. H. Walker, Manager of Engineering.

Prior to his association with Wyeth, where he served as assistant to the manager of plant operations, Ohlson was connected with Niacet Chemicals Corporation, Niagara Falls, N. Y., as process engineer.

## Calco Promotes Naylor

BOUND BROOK, N. J., August 1, 1945—Appointment of James L. Naylor, as assistant manager of the Dyestuff Department, Calco Chemical Division, American Cyanamid Company, has been disclosed by J. Pfister, manager. Mr. Naylor has been in the employ of Calco fifteen years, and for the past seven years has been manager of the Providence district sales office.

## Hooker Lists Products

The new Hooker General Products List, Bulletin 100, just from the press, is a handy, file-size folder containing brief information on nearly 100 chemicals. The data includs description, chief uses and shipping container information. Several new chemicals are listed for the first time in this edition.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
W. L. Cook, Editor

## PAPER OUTLOOK FAVORABLE

Prospects of an improving paper supply for trade consumption continue favorable. All factual data currently available indicate the trend of more paper for normal uses will slowly continue to rise. Increased pulpwood receipts in June are an encouraging factor and if the present number of war prisoners are retained for pulpwood cutting in the South, wood supplies should be sufficient to provide substantial relief to the still tight supply of kraft wrapping, board, and bag papers. Although favorable developments in the Pacific war may create a more ample supply of kraft products before the termination of the conflict, military demand for kraft paper is expected to continue until that war ends.

In commenting on the military requirements, the Department of Commerce explains that, while military requirements for certain types of paper and paperboard have eased slightly, the demand for others has increased, notably in the waterproof and shipping sack grades. It has been estimated that from 60 to 75% of army supplies in Europe can be used in the Pacific and the quartermaster corps needs large quantities of greaseproof and waterproof paper, case liners, gummed tape, fiber shipping containers, folding boxes, shipping tags, etc. for repacking these goods. The increased military supplies will be furnished mostly at the expense of already short civilian supplies of wrapping and bag papers. The program determination for the current quarter for paper and paperboard, the report goes on to state, is much different from those of the previous six quarters. This is indicated in the minimum production of the most essential types of paper products and the minimum quantities of pulp required for their production. For the production of 85,000 tns of asphalting and creping paper the minimum tonnage of wood pulp is set at 87,000 tons; for 106,280 tons of shipping sack paper, 110,000 tons of pulp are required; for 1,080,000 tons of containerboard, 635,000 tons of wood pulp; for all other unspecified grades of paper and paperboard, 1,886,000 tons of pulp. This program calls for a total tonnage of 2,718,000 tons of wood pulp.

The continued high demand for paperboard is indicated in the current rate of production of 93%. Production of all grades in the first quarter of 1945 totaled 2,234,247 tons, compared with 2,197,797 tons in 1944; in the second 1945 quarter, 2,315,396 tons, compared with 2,295,334 tons in 1944; while in April, May and June output in 1945 totaled 2,315,146 tons, compared with 2,245,553 tons in the full third quarter of 1944. Minimum production requirements for containerboard are about the same in the current quarter as in the second quarter of this year. Military requirements for ammunition containers and overseas shipping boxes have eased but the over-all military and civilian demand continues as high as formerly. Requirements for V-boxes are somewhat lower and call for 300,000 tons in the current quarter, compared with about 335,000 tons in the second, 1945 quarter. Although June allocations were set at nearly 80,000 tons of solid fiber and over 12,000 tons of corrugated board, military cutbacks taking place will release more boxes for essential civilian products in the last quarter of this year. Allocations for the current month are expected to amount to 95,000 to 97,000 tons. The amendments to containerboard Order M-290, which became effective on July 2, consist principally of incentive authorization by WPB to all corrugated and solid fiber container manufacturers, allowing them to receive additional tonnages of containerboard and thus expand production. It provides for the filling of incentive orders on a monthly basis when specific permission to do this has been obtained from WPB. Other provisions of this order limit the uses to which certain kinds of containerboard may be put; establish inventory ceilings; prohibit the use of ratings; provide for the issuance of directions for the production and delivery of containerboard and its end products; and require producers to manufacture and ship specific amounts of containerboard if they wish to produce certain other kinds of paper and paperboard.

## FINE PAPER SUPPLY IMPROVES

More fine papers will be available in the current and fourth quarters of this year, reports now indicate. Production of fine papers in May, estimated at 85,000 tons, compares with 78,000 tons in April and with 83,000 tons in April, 1944. Output for the first five months of 1945 increased to 415,000 tons, compared with 404,000 tons in the five-month period in 1944. This is an increase of 2.7%. In its latest report, the Department of Commerce states that the consumption of market wood pulp in the manufacture of fine papers in 1944 aggregated 298,229 tons, or 39.2% of the total fine paper output, while manufacturers consumed 410,723 or 54.1% of their own pulp, and 51,072 tons or 6.7% from the pulp produced at the paper manufacturers' other mills made up the balance.

Increased supply of fine papers in the current quarter is based upon the improved wood pulp supply. This larger tonnage of pulp is partly due to higher production in Canada and to the decreasing demand for nitrating purposes. The rosin supply situation remains, however, unfavorable. Low rosin inventories are partly due to past unfavorable weather and to lack of labor and to very heavy government requirements, including heavier shipments overseas.

### Expects Paper to Continue Scarce

INDIANAPOLIS, Ind., July 30, 1945—Little change was seen in the paper market here during the last week. In spite of the fact that hundreds of Indiana soldiers are being discharged each week from Indiana camps, the paper converters and manufacturers say the manpower situation has been improved but little. It would seem that the discharged soldier has heard about fabulous prices being paid to workers in defense plants in this area and that is where he hits first. Being a veteran, he is given a preference. The scarcity of supplies now is expected to continue until after the war with Japan is ended. Many believe, however, that the last quarter of the year will see more paper released for civilian use.

Last week saw a continued demand for tissues of all kinds. The demand for summer specialties also showed a marked increase with the coming finally of hot weather. The late spring caused summer specialties to get a very late start. Wrapping paper and bags also were in much demand with prices firm at the established levels. Stocks continued low and are expected to remain so for several weeks.

Building paper demand also was good the last week and the volume for the first six months of the year, both for building paper and roofing, is considerably ahead of that of a year ago. It is reported that stocks are adequate, but inventories generally are light, the jobbers preferring well balanced stocks to large ones. The fall building season also is expected to be good.

Newsprint demand is at quota levels and Indiana publishers are looking forward to the time when quotas will be increased. Advertising lineage continued to be fair, but much advertising is being refused.

The latest waste paper collection in this city showed the volume to be about the average and every effort is being made by authorities to increase it. Mill demand continued good with prices at ceiling.

## Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

| Current Weeks—1945 | | Corresponding Weeks—1944 | |
|---|---|---|---|
| June 23 | 90.4 | June 24 | 90.8 |
| June 30 | 87.5 | July 1 | 86.2 |
| July 7 | 47.9 | July 8 | 50.9 |
| July 14 | 88.5 | July 15 | 87.7 |
| July 21 (Revised) | 89.8 | July 22 | 91.2 |
| July 28 | 93.4 | July 29 | 91.3 |

COMPARATIVE MONTHLY SUMMARIES

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1944 | 88.7 | 88.5 | 88.1 | 87.6 | 88.7 | 89.8 | 80.3 | 90.6 | 88.2 | 92.5 | 90.6 | 92.4 | 88.1 |
| 1945 | 86.7 | 89.4 | 90.2 | 88.1 | 89.8 | 91.2 | *80.8* | | | | | | |

COMPARATIVE YEARLY SUMMARIES

| | 1938 | 1939 | 1940 | 1941 | 1942 | 1943 | 1944 | 1945 |
|---|---|---|---|---|---|---|---|---|
| Year to Date | 67.9 | 78.6 | 86.9 | 93.6 | 95.2 | 87.8 | 87.4 | 87.9 |
| Year Average | 71.5 | 83.4 | 85.6 | 97.4 | 90.4 | 87.8 | 88.1 | |

*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD RATIOS†

| Current Weeks—1945 | | Corresponding Weeks—1944 | |
|---|---|---|---|
| June 23 | 96 | June 24 | 96 |
| June 30 | 96 | July 1 | 95 |
| July 7 | 62 | July 8 | 60 |
| July 14 | 90 | July 15 | 91 |
| July 21 | 96 | July 22 | 94 |
| July 28 | *95* | July 29 | 96 |

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1944 | 90 | 96 | 95 | 96 | 96 | 96 | 85 | 96 | 92 | 95 | 95 | 85 | 93 |
| 1945 | 91 | 95 | 97 | 97 | 96 | 96 | *86* | | | | | | |

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

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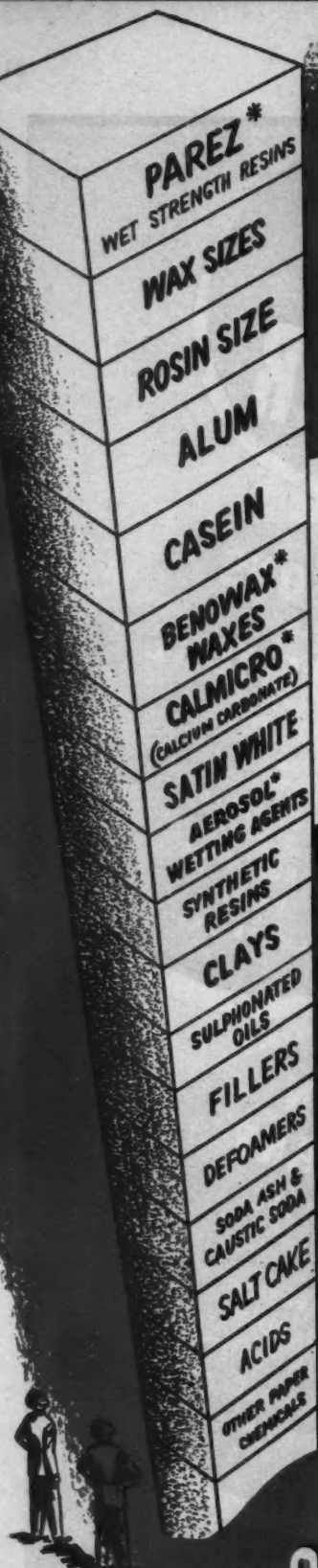


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Section of the
TECHNICAL ASSOCIATION
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Edited by R. G. Macdonald, Secretary

# A Study of the Melamine Resin Process For Producing Wet Strength Paper*

By C. G. Landes[1] and C. S. Maxwell[1]

**Abstract**

*A recently developed process involving addition of a melamine resin colloid to slush paper stock has provided an improved method of making wet strength paper. The process has already been adopted for the production of a wide variety of commercial papers useful in connection with war purposes where superior wet and dry strength properties are required. Laboratory studies of the peculiar changes that take place during the formation of the resin colloid have led to the development of an improved method of preparation for paper mill application.*

*Certain paper machine operating variables are shown to have important effects on wet strength efficiency, while other factors are indicated as requiring further investigation. Methods of reuse of wet strength broke are described, and other special problems relating to wet strength paper are discussed. It has been found that certain special precautions must be taken in laboratory handsheet evaluations to insure reproducible results. A short discussion is given of studies relating to the fundamental mechanism of the new wet strength process.*

In 1943 an excellent review of the literature on wet strength paper was published by Collins *(1)*. Of the many wet strength processes suggested up to 1942 only a few have survived in commercial practice. One process that has been used by several mills from about 1935 to the present time consists of impregnating or tub sizing a preformed sheet with a urea formaldehyde composition or "resin," followed by heating to effect curing. This method permits any desired pick-up of resin, and therefore, any degree of wet strength, but a number of disadvantages have prevented widespread utilization. One of the most serious of these disadvantages is the adverse effect on dry tearing and folding strength of the paper when sufficient resin is present to impart a high degree of wet strength. Also, many paper mills do not have available the required impregnating or tub sizing equipment.

## The New Melamine Resin Process

About two years ago, after extensive laboratory and field tests had been completed, a new process was announced for the production of wet strength paper. This process, as described briefly by Maxwell *(2)*, involved addition to the paper machine slush stock of small amounts of a melamine resin colloid prepared according to a patent recently issued to Wohnsiedler and Thomas *(3)*. The introduction of the new process in 1942 was followed by an immediate increase in the production and use of wet strength paper. For example, thousands of tons of wet strength map paper *per month* have been made for the Armed Forces, by the incorporation of melamine resin colloid. A number of government specifications for other grades of paper have included requirements relating to wet strength properties.

Naturally, the availability of this new method has stimulated interest among paper manufacturers and users in the development of a wide variety of new grades of paper having wet strength properties, and directed not only to fulfilling critical war requirements but also toward expanding the general usefulness of paper. A few of the uses for resin treated paper have been indicated in recent articles by Kumler *(4)*, Zaumeyer *(3)*, Freeman *(6)*, and Britt *(7)*. Grades mentioned include bag, map, tag, food wrap, toweling, tissue, photographic and blueprint stock, coating base stock, impregnating stock, twisting, and many others.

An interesting point, in connection with the expanding use of the melamine resin colloid process, has been the realization that "something new has been added" to the treated paper, aside from the increase in wet strength which was the original objective. It has been found that *dry* tensile and *dry* bursting strengths are improved considerably. The dry folding endurance is increased, often as much as several hundred per cent. Wet and dry scuff resistance are improved to a great extent. Better efficiency in the use of rosin and wax sizes is obtained.

As a result of effects such as mentioned above it is often possible to reduce the basis weight of the paper or use cheaper or more available fibers and still retain the desired serviceability of the sheet. In some cases use of the resin permits a substantial reduction in the beating or refining of the stock without loss of finished sheet strength properties, thereby providing a paper with reduced tendency to expand or contract under varying atmospheric humidity conditions. By virtue of such benefits, the use of melamine resin is expanding to grades such as bond, coating rawstock and others where the wet

* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

[1] Member TAPPI; American Cyanamid Co., Stamford Research Laboratories, Stamford, Conn.

strength imparted forms only one of the minor reasons for addition of the resin.

### New Urea Resins

The widespread demand for wet strength paper has led to recent developments in the use of urea formaldehyde resins which can be added to slush stock to give wet strength paper. Myers and Morin have discussed the results obtained with one of these special resins *(8)*, and such resins are of interest in connection with the general problem of producing wet strength paper. However, it should be noted that these urea resins differ from the melamine resins covered in the present report, not only in their nature but also in the mechanism and degree of their retention by paper fibers.

### Scope of the Investigation

The use of melamine resins for wet strength paper has progressed so rapidly that very few mills or laboratories have been able to investigate the fundamental aspects of the process, or even to cover the effects of all the operating variables that are encountered in the practical application of any new process to papermaking. In fact, the only technical article covering to any extent fundamental aspects of melamine resin treatment of paper, other than references previously cited, has been an interesting publication by Britt *(9)*.

In the authors' laboratories, studies relating to the application of the melamine resin colloid to paper have shown a number of interesting results, some of which have been of assistance in increasing the efficiency of the treatment. Also, cooperative studies with paper mills, government agencies, and others have brought to light many factors of practical importance relating to the manufacture and use of wet strength paper. It is the object of this paper to present the results of some of this work, with the hope that it will be of assistance in obtaining maximum benefits from the use of melamine resins, and in stimulating paper mill laboratories to conduct additional research directed toward the same end.

### Description of Resins

The first melamine resin used commercially for producing wet strength paper by a "beater addition" process, as described by Maxwell *(2)*, was marketed under the name "Paper Resin 605." This resin was a melamine-formaldehyde product of a low degree of condensation, and was soluble in hot water up to about 20% solids.

More recently a slightly modified resin (Parez* 607) has been introduced and, due to the improved results obtained, has entirely supplanted the original type. The new resin is a melamine-formaldehyde product of a moderate degree of condensation, with properties as shown in Table I.

TABLE I.—PROPERTIES OF THE MODIFIED RESIN

| | |
|---|---|
| Form | Dry white powder |
| Particle size | 98% passes through 100 mesh |
| Apparent density | 0.4 (approx. 25 lb./C.F.) |
| Water solubility | Disperses in water with agitation at 50 to 60% solids, but hydrophobes out on further dilution. |
| Moisture content | 3% maximum |
| Nitrogen content | 37 to 40% |
| Factor (x Nitrogen = % Resin) | 2.6 |
| Viscosity (60% solids—25°C.) | 300 to 700 cp. |
| pH (60% solids dispersion) | Approximately 9 |

### Preparation of Resin Solutions

The method originally used for preparing the melamine resin solution was to dissolve the resin in an aqueous hydrochloric acid solution at 140°F., with a resin solids content of about 20%[1], and then dilute with cold water to 12%. After aging at room temperature for at least 12 hours, the solution was ready for use. In this solution the molar ratio of resin to acid was approximately 1 to 1.

The modified procedure, introduced commercially shortly after the change from the original resin to the modified form, is similar in general to the original procedure, but with the following differences.

1. The amount of acid has been reduced so that the ratio is now about 1 mol. of resin (as monomer) to 0.8 mol. of HCl.
2. The procedure has been simplified in that the acid is added to the full quantity of water required for a 12% resin solution, and the resin then stirred into the acid-water solution at 80 to 100°F. The intermediate steps of heating and dissolving at 20% solids are eliminated. This simplification is possible partly because of the fact that the fine, spray dried particles of the modified resin are more easily dispersed in acid solution than was the case with the earlier resin.
3. Minimum time for aging the 12% solution has been reduced to 3 hours.

The standard laboratory procedure for preparing resin solutions for treatment of paper stock is given below. Commercial batches are prepared in exactly the same way, making due allowances for the size and type of handling equipment required *(11)*.

| *Formula* | By Weight g. | By Volume ml. |
|---|---|---|
| Water (between 80-100° F.) | 183.1 | 184.2 |
| Muriatic acid (20° Be°) | 9.9 | 8.5 |
| Total water plus acid | 193.0 | 197.7** |
| Resin | 25.0 | (25.0 g.) |
| Total, final volume | 218.0 | 208.0 |

* 20° Be muriatic acid contains 31.45% HCl. If acid of higher or lower HCl content is used, suitable adjustments should be made so that the amount of HCl and the total volume of water plus acid both remain constant.

** In laboratory practice it is easier to dilute the acid to approximately 190 ml., dissolve the resin and then add sufficient water to bring the final solution to exactly 208 ml.

*Procedure*

The acid should be stirred into the water, and then the resin added to the solution with constant agitation until the resin is dissolved. The resin solution is aged (at 12% resin solids) for at least 3 hours at 80 to 100° F., and can then be used for making wet strength paper at any desired aging time from 3 hours up to several days. A convenient practice is to prepare the solution one day, and use it the next.

### Resin Solution Properties

Before passing to the use of the resin-acid solution in the treatment of paper, it is of interest to note some of the peculiar changes that occur when melamine resin is dissolved in acid and aged. A number of factors influence the nature and rate of these changes, among the most important being concentration of resin, resin-acid ratio, and temperature. To illustrate the effect of one of these variables, the resin to acid ratio, reference is made to the patent recently issued to Wohnsiedler and Thomas *(3)*.

A chart is presented in the above patent, and is shown in Fig. 1. To obtain the data shown in this

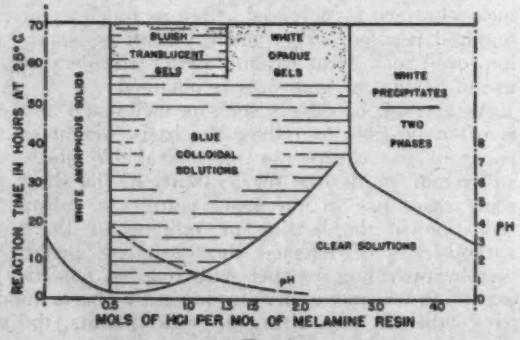


FIG. 1
**Variations in Resin-Acid Ratio**

* Trade mark of American Cyanamid & Chemical Corp. applies to its synthetic resins for use by the paper industry.

[1] All resin solids percentages are expressed on a weight-volume basis, equivalent to grams per 100 ml.

figure, samples of melamine resin were dissolved at 15% solids content in water and hydrochloric acid, the amount of acid being varied so as to give resin-acid molar ratios varying from about 1:0.3 to 1:4.0. All of the solutions were allowed to age at 25°C., and visual observations made during the course of aging.

By inspection of Fig. 1 it is evident that such solutions behave quite differently as the amount of acid is varied, and that under certain conditions an acidic solution of melamine resin in the colloidal form is obtained, and maintained over an aging period of at least a day or two. It had been found *(2, 3)* that these colloidal melamine resin solutions have several remarkable properties, including the following:

1. The concentrated resin solutions are infinitely dilutable with water.
2. The colloidal resin particles are positively charged.
3. The resin is attracted to and largely retained by cellulose fibers, even in very dilute fiber-water suspensions.

A brief indication of the importance of resin concentration during aging is given by the following experiment. Samples of the original resin were prepared exactly according to the original method as described under "Preparation of Resin Solutions," except that the final resin concentration was varied from 10 to 20%, and aged until gelling took place. Results are shown in Fig. 2, it being apparent that there is a pronounced increase in the speed of gelling as the resin concentration is raised.

The importance of controlling both concentration and temperature, while preparing the resin solution, is indicated by noting the difference in results obtained with the original resin dissolving procedure as compared to the improved procedure now used with the new resin. To reduce the number of variables in this experiment, however, only the new resin was used, with a resin:acid molar ratio of 1.0:0.8. Viscosity curves for three resin solutions prepared by various procedures, but aged under identical conditions, are shown in Fig. 3. The much slower increase in viscosity of solution C is quite apparent

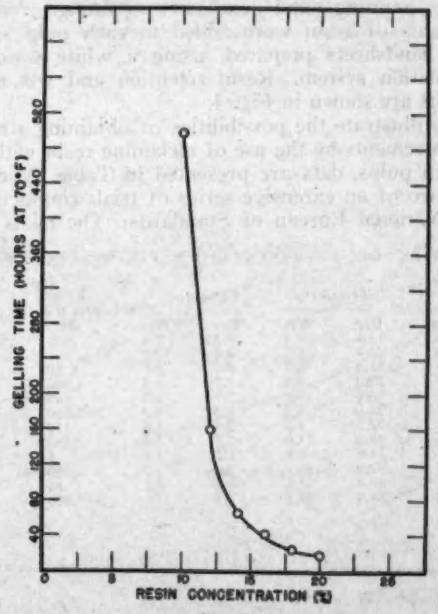


FIG. 2
**Gelling Time at Various Resin Concentrations**

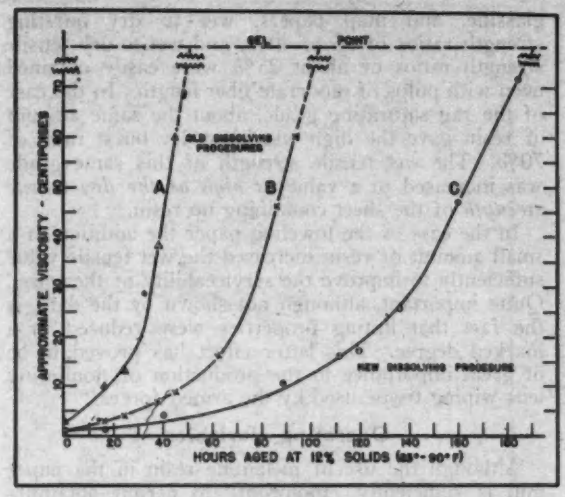


FIG. 3
**Effect of Resin Dissolving Procedure on Viscosity During Aging. Solution A—Dissolved at 20% Solids and 135 Degs. F., Diluted after 15 Min. Solution B—Dissolved at 20% Solids and 135 Degs. F., Diluted Immediately. Solution C—Dissolved at 12% Solids and 85-90 Degs. F.**

and illustrates the greater margin of safety of the new resin dissolving procedure.

The above-mentioned changes, which occur as the resin-acid solution is aged, are of practical importance but by no means comprise all of the changes that are of both practical and theoretical interest, e.g., during the course of research work conducted during the past few years, it has been found that during aging of the melamine resin-acid solution at room temperature definite *changes* occur in the following properties: (1) resin particle size, (2) resin particle charge, (3) solution "viscosity," (4) stability to precipitation by acids or electrolytes, (5) stability to precipitation by water miscible solvents, (6) pH of solution, (7) amount of free formaldehyde in solution, and (8) surface activity,

The study of the nature and cause of these changes offers great complexities, but it is hoped that the results of some of these fundamental studies can be described, by the various workers concerned, in the near future. Fortunately the papermaker does not need to be alarmed by the existence of the variables mentioned above, as sufficient data are already available to enable satisfactory and profitable use of melamine resin colloids, as will be demonstrated.

## Typical Paper Mill Results

Before discussing some of the recent research work on the practical aspects of using melamine resin colloid for paper treatment, it might be of interest to note some typical results that have been obtained in commercial practice. Just recently physical tests were made on a number of sets of treated *vs.* untreated papers obtained from several paper mills. Some of the results of these tests are shown in Table II, and illustrate typical effects that are being obtained by mills from various parts of the country, making widely different grades of paper.

Inspection of the data of Table II brings out a number of interesting points. Dry tensile and fold tests were improved in nearly every case. For all the grades tested the increase in wet rub resistance was quite pronounced.

By the use of moderate amounts of resin in bag,

glassine, and map papers, wet-to-dry bursting strength ratios of 35 to 40%, and wet-to-dry tensile strength ratios of about 25% were easily obtained even with pulps of moderate fiber length. In the case of the rag saturating grade, about the same amount of resin gave the high wet burst-dry burst ratio of 70%. The wet tensile strength of this same grade was increased to a value *as high as the dry tensile strength* of the sheet containing no resin.

In the case of the toweling paper the addition of a small amount of resin increased the wet tensile value sufficiently to improve the serviceability of the towel. Quite important, although not shown by the data, is the fact that linting properties were reduced to a marked degree. This latter effect has proved to be of great importance in the production of nonlinting lens wiping tissue used by the armed forces.

## Operating Variables

Although the use of melamine resin in the paper mill is sufficiently "foolproof" to permit obtaining reasonably good results in practically all cases, it is true that certain factors sometimes affect the efficiency of the treatment. Since the resin is more expensive, on a unit cost basis, than most of the other materials furnished it is important to maintain efficiency at the highest possible point.

### Point of Resin Addition

During the early commercial trials it was found that the point of addition of the melamine resin colloid to the slush stock often had a pronounced effect on the dry and wet strength properties of the finished sheet. To illustrate this effect, the results obtained at a mill making unbleached kraft bag stock are given in Table III.

TABLE III.*—EFFECT ON PAPER PROPERTIES OF VARYING THE POINT OF RESIN ADDITION (2.25% MELAMINE RESIN FURNISHED)

| Point of Resin Addition | To thick stock before fan pump | To dilute stock entering machine headbox |
|---|---|---|
| Resin content of paper (by anal.), % | 1.5 | 1.4 |
| Basis weight, lb. (25×40—500) | 65.7 | 62.7 |
| Tensile strength, lb./inch—Dry | 38.4 | 42.0 |
| Wet | 6.4 | 9.8 |
| Bursting strength—Dry | 66 | 65 |
| Wet | 12.9 | 18.2 |
| Folding endurance, MIT | †176 | 1777 |
| Tear, Elmendorf, grams | 130.8 | 117.6 |
| Porosity, Gurley, sec./100 ml. | 55 | 44 |
| Water resistance, Currier, sec. | 24.5 | 29.4 |
| pH of hot water extract | 4.8 | 4.8 |

* See notes for Table II.

It will be noted that merely by changing the point of resin addition nearer to the wire, the wet tensile and bursting strengths were increased about 40 to 50%. It had already been pointed out by Maxwell *(2)* that it is preferable to add the resin *after* the stock has been beaten or jordaned, rather than before. In general, it has been confirmed that the later the resin is added to the slush stock prior to actual sheet formation, the better the wet strength efficiency, but there appear to be some exceptions to this. Therefore, during development of any standard grade of wet strength paper, it is important to experiment with different points of resin addition to make sure that the optimum point has been found.

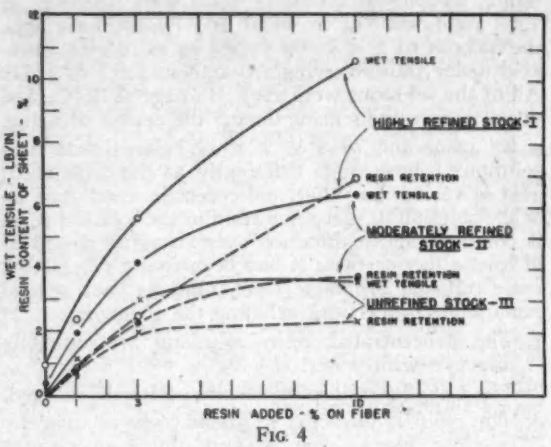


FIG. 4

Effect of Pulp Hydration. Pulp Freeness (Green, cc.): I—82; II—473; III—635.

### Pulp Hydration

The type of fiber and the degree of "hydration" (as obtained by variations in beating or refining) have an important effect on the retention of melamine resin colloid and on the sheet strength properties obtained. The effect of variations in mechanical treatment of a specific stock has already been indicated by Maxwell *(2)*, and further illustration of this effect is demonstrated by the following experiment. Southern bleached kraft pulp was treated so as to obtain samples representing no refining, moderate refining and excessive refining. Varying amounts of resin were added to each pulp sample and handsheets prepared, using a white water recirculation system. Resin retention and wet tensile results are shown in Fig. 4.

To illustrate the possibilities of obtaining strength improvements by the use of melamine resin with well beaten pulps, data are presented in Table IV covering two of an extensive series of trials conducted by the National Bureau of Standards. The trials were

TABLE II.—EFFECT OF MELAMINE RESIN ON PHYSICAL PROPERTIES OF REPRESENTATIVE COMMERCIAL PAPERS

| Sample No. | Grade | Melamine Resin Content, % (a) | Basis Wt. (b) | Burst (c) Dry | Burst (c) Wet | Tear (d) Dry | Tear (d) Wet | Tensile (e) Dry | Tensile (e) Wet | Elongation (f) Dry | Elongation (f) Wet | Wet Rub (g) | MIT Fold (h) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Toweling—creped | 0 | 31.7 | 24.0 | 5.0 | 68 | 16 | 12.4 | <0.4 | 4.2 | 5.0 | ..... | 265 |
| 2 | Toweling—creped | 0.47 | 33.2 | 26.0 | 7.0 | 78 | 48 | 12.4 | 1.6 | 7.2 | 10.1 | ..... | 319 |
| 3 | Kraft bag | 0 | 41.2 | 39.0 | 4.0 | 76 | 84 | 27.4 | 2.2 | 2.4 | 2.7 | 30 | 574 |
| 4 | Kraft bag | 1.08 | 42.0 | 48.0 | 18.5 | 62 | 110 | 29.2 | 8.0 | 2.7 | 8.0 | 1,980 | 638 |
| 5 | Glassine | 0 | 30.2 | 18.0 | <2.0 | 18 | 21 | 16.0 | 1.0 | 1.7 | 2.0 | 45 | 216 |
| 6 | Glassine | 1.22 | 31.5 | 21.5 | 8.0 | 19 | 41 | 20.0 | 5.2 | 1.5 | 4.3 | >10,000 | 1566 |
| 7 | Army map | 0 | 67.5 | 41.0 | 4.5 | 118 | 64 | 32.2 | 4.2 | 2.5 | 3.6 | 115 | 161 |
| 8 | Army map | 1.17 | 67.0 | 60.0 | 21.5 | 96 | 116 | 48.2 | 11.0 | 2.7 | 5.0 | 2,985 | 994 |
| 9 | Rag saturating | 0 | 43.5 | 16.0 | <2.0 | 144 | ... | 14.8 | 0.8 | 1.7 | 3.4 | 1 | 84 |
| 10 | Rag saturating | 1.15 | 45.8 | 43.0 | 30.0 | 144 | 184 | 32.8 | 14.2 | 3.0 | 5.3 | 1,560 | 1214 |
| 11 | Ledger * | 0 | 65.8 | 53.0 | 3.1 | 120 | 56 | 39.0 | 2.6 | 3.7 | 3.1 | 35 | 746 |
| 12 | Ledger * | 2.93 | 68.0 | 85.0 | 53.0 | 102 | 154 | 58.4 | 28.2 | 5.1 | 7.9 | >10,000 | 2171 |

* Also contain glue, applied as a tub size.
(a) Amount of resin furnished unknown; normal retention is 60 to 80%.
(b) Basis weight, lb. (25×40—500).
(c) Bursting strength, points.
(d) Elmendorf tear, grams (C.D.). Wet tearing values erratic.
(e) Tensile strength (M.D.), lb./inch, Schopper.
(f) Elongation (M.D.), %.
(g) Wet rub (M.D.), Aminco, number of double rubs until sheet rubs through. Water applied to sample at start of rubbing.
(h) Folding endurance (M.D.).
All wet tests run after soaking samples 16 hours.

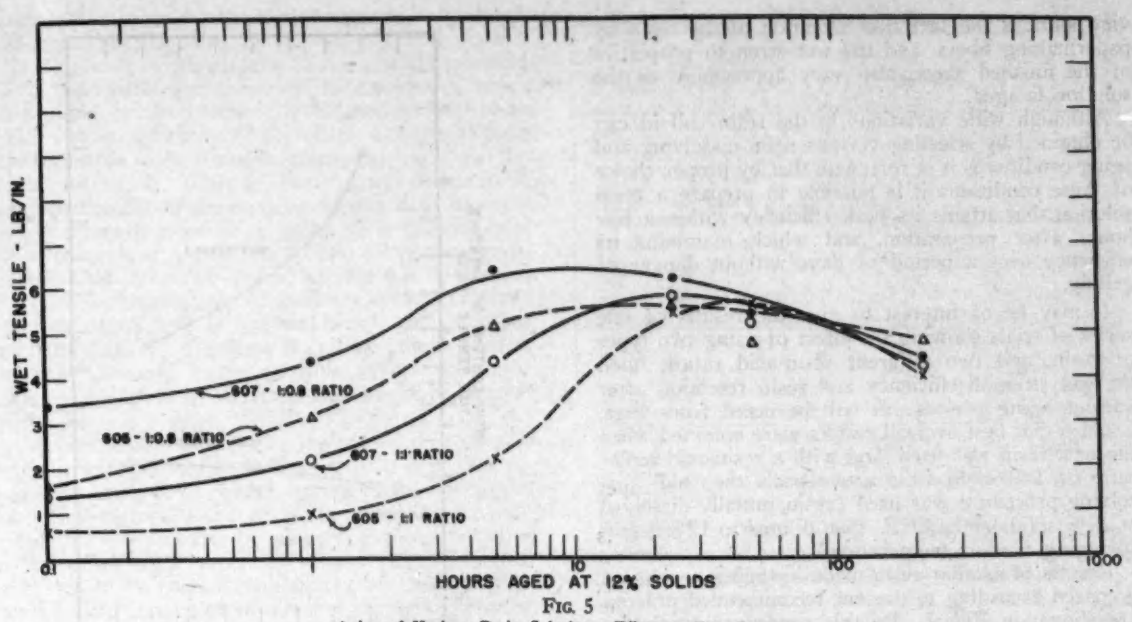


FIG. 5

Aging of Various Resin Solutions—Effect on Wet Strength

made on a semicommercial fourdrinier machine, all furnish and operating conditions being maintained constant except for the addition of resin. The melamine resin solution, when used, was added at the headbox of the paper machine.

The data shown in Table IV indicate that with these well beaten pulps, the addition of 3% resin on the weight of fiber gives sheets which show striking increases in all dry and wet strength properties, with the exception of dry tear. It will be noted that in the case of the cotton fiber paper, the *wet* bursting strength of the resin treated sheet exceeds the *dry* bursting strength of the untreated sheet.

### AGE OF RESIN SOLUTION

It has already been pointed out that a number of chemical and physical changes take place as melamine resin-acid solutions age, and that variation in solution and aging conditions affect these changes to a marked degree. More important, from the practical

TABLE IV.*—EFFECT OF RESIN ADDITION TO WELL BEATEN STOCK

| | 100% Cotton Fiber 12 hr. Beating | | 100% Sulphite Fiber 7 hr. Beating | |
|---|---|---|---|---|
| Resin added, % on fiber | 0 | 3 | 0 | 3 |
| Resin retained, % on sheet weight | 0 | 2.4 | 0 | 2.4 |
| Tensile strength, lb./in.—Dry | 35.2 | 46.4 | 39.0 | 48.2 |
| Wet | 1.4 | 20.8 | 1.2 | 14.2 |
| Bursting strength, points—Dry | 42.0 | 69.0 | 36.0 | 53.0 |
| Wet | 5.2 | 42.7 | 5.8 | 26.5 |
| Wet rub | 8 | 5640 | 6 | >10,000 |
| Fold—MIT | 1439 | 4397 | 269 | 697 |
| Tear, grams | 156.4 | 111.8 | 58.4 | 40.4 |
| Basis weight, lb. | 63.8 | 59.7 | 58.6 | 59.4 |
| pH of stock to wire | 7 | 6.6 | 7 | 5.2 |

* See notes for Table II.

* These data were obtained from the National Bureau of Standards and form a part of a more extensive study there, the results of which are being prepared in full for publication by the Bureau at some future time.

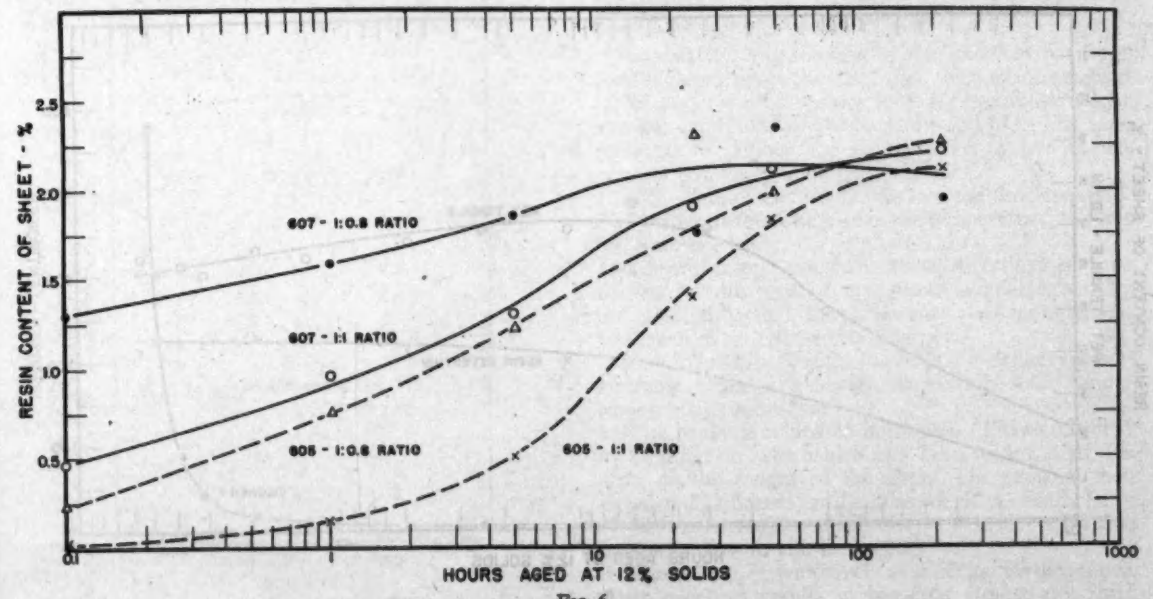


FIG. 6

Aging of Various Resin Solutions—Effect on Retention

viewpoint, is the fact that retention of the resin by papermaking fibers, and the wet strength properties of the finished sheet, also vary appreciably as the solution is aged.

Although wide variations in the resin colloid can be obtained by selecting various resin dissolving and aging conditions, it is fortunate that by proper choice of these conditions it is possible to prepare a resin solution that attains its peak efficiency within a few hours after preparation, and which maintains its efficiency over a period of days without danger of gelling.

It may be of interest to give the results of one series of trials showing the effect of using two types of resin, and two different resin-acid ratios, upon the wet strength efficiency and resin retention after various aging periods. It will be noted from Figs. 5 and 6 that best over-all results were obtained when the new resin was used, and with a resin-acid molar ratio of 1:0.8. For the above trials the "old" dissolving procedure was used (resin initially dissolved at 20% solids and 140°F., then diluted to 12% solids for aging at room temperature).

Results of similar tests made by aging a solution prepared according to present recommended practice are shown in Fig. 7. By this procedure maximum wet strength is obtained after about 3 hours' aging of the 12% resin solution, and is substantially maintained for a period of a week.

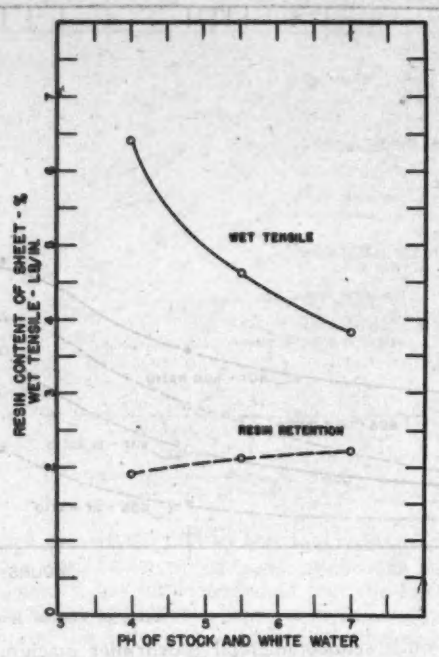


FIG. 8
Effect of Stock pH on Wet Strength Efficiency

### pH and Alum

The following experiments show the effects of variations in stock pH and amount of alum furnished on wet strength efficiency. In one series of handsheet trials constant amounts of resin colloid and alum were added to the stock, and the pH of the stock and of the white water varied by addition of HCl or NaOH. Results are shown in Fig. 8. It was indicated that with constant sheet drying conditions (1 minute at 240°F.), the wet tensile decreased as the pH was raised. However, even at a pH of 7 a substantial degree of wet strength was obtained.

For the next series of tests, all conditions were held constant (stock pH at about 4.5), except that varying amounts of alum were added to the stock before addition of the resin solution. The data presented in Fig. 9 indicate that the presence of alum is not required to obtain good resin retention and wet strength. This fact is of considerable importance in the case of certain grades of paper, such as toweling, where the use of alum reduces absorbency.

The most important factors governing the cure of thermosetting resins are stock pH, drying temperature, and drying time. The melamine resin colloid cures easier than most other thermosetting resins, and, therefore, it usually is possible to balance the variables mentioned above so that a substantial degree of cure is obtained on the paper machine. Additional wet strength often develops after the paper is aged

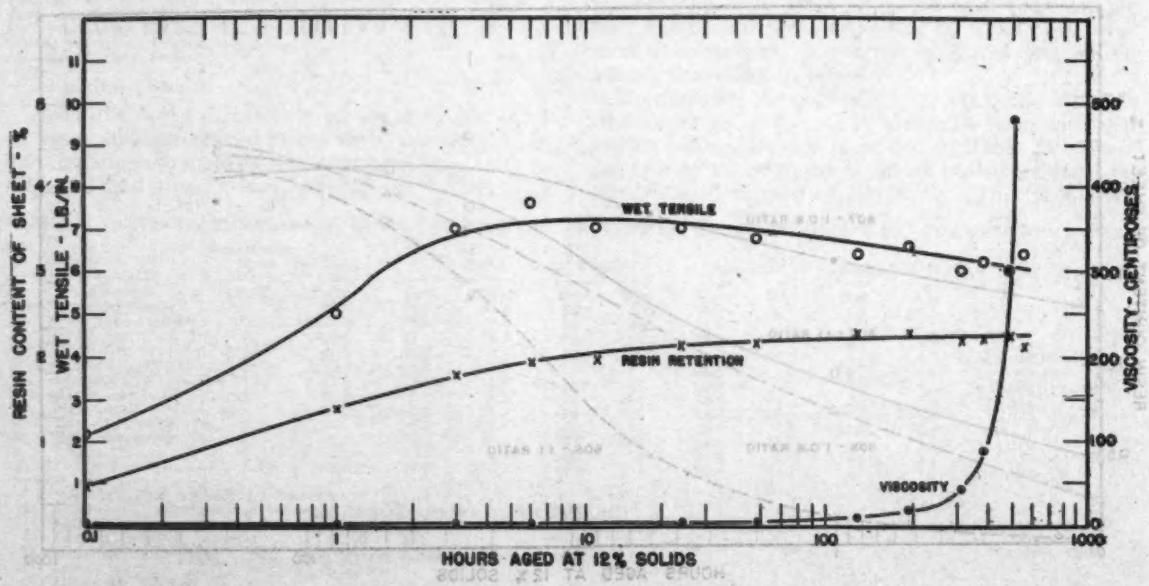


FIG. 7
Effects of Aging Standard Resin Solution

several days, particularly if the sheet is wound hot and stored in roll form.

It is difficult to duplicate by laboratory experiments all of the variables encountered in commercial practice, and for this reason it is frequently helpful to make a thorough study of the effect of paper drying conditions on wet strength efficiency, right in the paper mill itself. This is particularly desirable if samples directly off the machine show a large increase in wet strength after being given an additional cure of 10 minutes at about 260°F. in a laboratory oven. Factors that should be studied include rate of drying, drier temperature gradient, moisture content of sheet entering driers and of finished sheet, etc. Another point to check, if the sheet is tub or calender sized, or water finished, is the possible adverse effect of alkaline or buffering materials that might be present in the solution used.

All colloids are affected by the presence of electrolytes in solution, but the effects vary widely depending upon the type of colloid, nature of the electrolyte, and other factors. Laboratory experiments have indicated that the presence of an excessive concentration in the stock of a polyvalent anion (e.g., sulphate) may result in partial flocculation of the melamine resin colloid and a decrease in wet strength efficiency. Further investigation is required to determine the significance of this observation with respect to practical mill operation.

Observations at one mill, where resin retention in the sheet was lower than normal, indicated that the suspended solids in the white water contained a rather high proportion of resin. This result suggested the following laboratory experiment.

Refined bleached kraft pulp was treated with 3% (on dry fiber) of melamine resin colloid, and 10 gram portions of this stock were then fractionated in a Bauer classifier and the various fractions analyzed for resin content. The distribution of fiber and resin among the various screen fractions is shown in Fig. 10. The fiber and resin contents of the fraction through 150 mesh were calculated by difference, due to the large volume of water used (60 gal./10 g. pulp) during processing.

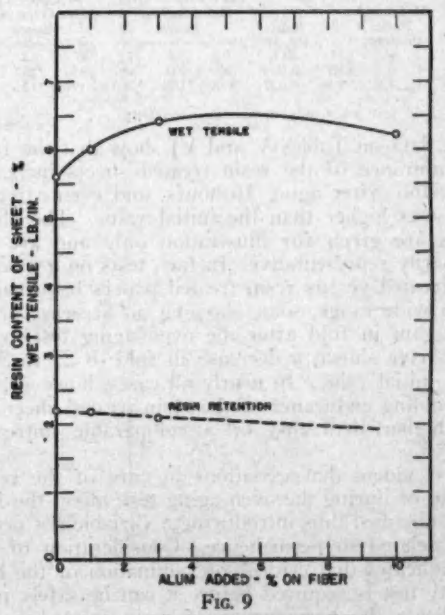


FIG. 9

**Effect of Alum on Wet Strength Efficiency**

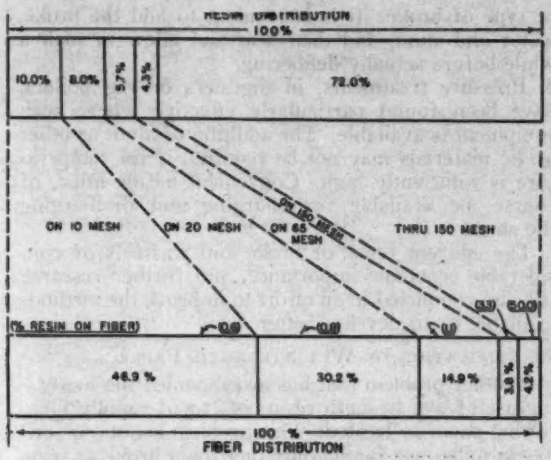


FIG. 10

**Distribution of Resin among Various Fiber Fractions**

The results shown in Fig. 10 indicated a progressive increase in resin content as the fiber size decreased, possibly because a larger surface was available for adsorption of the resin. However, other factors may have been involved, such as partial flocculation of the resin by the large volume of moderately hard water that was employed.

Further study is required to determine the extent and exact cause of concentration of resin in the suspended solids of white water under varying operating conditions. Such factors undoubtedly are related closely to over-all wet strength efficiency.

## Operating Problems

As with any new papermaking process or material, there usually are "a few thorns with the roses," and the melamine wet strength process is no exception. One of the desirable properties of paper treated by the process is that the wet strength obtained is substantially maintained under a wide variety of aging and exposure conditions. This property is, however, the direct opposite of what is desired when the papermaker starts to defiber wet strength broke or waste paper for reuse in his process.

### Broke and Waste Utilization

Fortunately, one solution to this problem has been found, based upon the fact that the melamine resin in the paper can be broken down by hydrolysis under suitable conditions of temperature and pH. The time required to defiber the resin treated paper is dependent primarily upon two factors:

1. pH—The lower the pH, the less the time required.
2. Temperature—The higher the temperature, the less the time needed.

Just how far one can go in these directions may be limited by the type of equipment available and by the possibility that the fiber may be degraded by treatment at an excessively low pH.

The following specific methods of defibering wet strength broke are being successfully used under commercial conditions:

1. The broke is added to hot water (170 to 190°F.) in a beater to which also has been added 2 to 3% alum on the weight of the fiber. The stock is then circulated or beaten until defibered. It is usually helpful to mechanically shred the dry broke or waste before adding to the beater.
2. Special equipment, such as a Dilts Hydrapulper, gives excellent results in handling almost any form

or type of broke. It is convenient to add the broke, water and alum, and then heat and allow to soak a while before actually defibering.

3. Pressure treatments, in digesters or rag boilers, have been found particularly effective where such equipment is available. The addition of alum or other acidic materials may not be required if the temperature is sufficiently high. Convenient means must, of course, be available for charging and discharging the stock.

The efficient reuse of broke and waste is of considerable economic importance, and further research is being conducted in an effort to improve the methods available or to develop better ones.

### Identification of Wet Strength Paper

Another problem that has accompanied the increasing use of wet strength resins is that of rapidly identifying paper so treated. This problem is not too serious in mills that handle only their own broke or trim, as it can be carefully segregated and then defibered separately. However, in the case of waste from printing or converting plants, or mixed waste papers accumulated by the waste paper dealer, a much more difficult situation can arise. In order to properly classify and treat such waste, it would be highly desirable to be able to quickly and accurately determine whether wet strength paper was present, and if so, the nature of the resin or treatment which had been used.

It is possible to identify the nature of the wet strength agent in paper by means of laboratory tests, but these require appreciable time and the services of a trained chemist, and are not suited for the examination of large quantities of mixed papers. However, an outline of some of these laboratory procedures has been published in the *Paper Trade Journal* by Stafford and others, and may be of assistance in specific instances.

From the practical standpoint, a quick and simple procedure is required, one by which any paper mill operator or waste paper dealer can easily determine the nature of the treatment either by visual observation or application of a test requiring only a few seconds. Investigation of various possibilities is continuing, and it is hoped that paper technicians throughout the industry will give this important problem their attention, as its solution will be of great assistance to all paper mills making wet strength paper of using wet strength waste.

## Special Problems

During the course of three years' commercial use of the melamine resin colloid process in mills throughout the country, surprisingly few machine operating troubles have been encountered and these have generally been eliminated by minor process modifications. Corrosion of equipment by the hydrochloric acid of the resin solution has not been evident, except possibly in a few instances where the pH was not adjusted to the normal operating point.

Likewise, no indication has been obtained to date that the presence of the small amount of acid added to the furnish with the resin has any deteriorating effect on the aging quality of the paper, provided that adequate precautions are taken to maintain the pH of the stock and paper at the proper values. Obviously, however, a number of complex factors must be critically evaluated before any conclusions can be drawn with regard to the effect of the resin treatment on the life of papers that are expected to last for hundreds of years.

The permanence of paper is affected by numerous paper quality and use variables, as indicated by the extensive literature which has been reviewed to 1939 by Kantrowitz, Spencer, and Simmons *(10)*. Aside from fiber purity differences, one of the most important factors found to affect permanence adversely is the presence of excessive acidity as indicated by titration and pH tests on the water extract from the paper. A common method of classifying papers as to expected permanence is the heat stability test (TAPPI 453 m-41), in which the folding endurance is measured before and after heating for 72 hours at 105°C. It has been stated that little or no drop in fold is indicative of a high degree of permanence.

In the work to date some indication has been obtained that great care will have to be taken in interpreting data obtained by comparing the folding endurance of samples before and after the usual oven aging test. To illustrate this point, data are shown covering heat stability tests on two types of paper not ordinarily requiring a high degree of permanence.

In Table V are shown the results of oven aging tests on bleached kraft handsheets containing melamine resin colloid, all conditions being maintained

TABLE V.—HEAT STABILITY TESTS ON BLEACHED KRAFT HANDSHEETS

| Sheet Batch | Melamine Resin Content, % | pH of Stock | MIT Fold—After Oven Drying, hours | | |
|---|---|---|---|---|---|
| | | | 0 | 16 | 72 |
| 1933 | 2.35 | 4.5 | 325 | 824 | 354 |
| 1934 | 2.70 | 5.5 | 244 | 586 | 286 |
| 1935 | 2.80 | 6.6 | 172 | 459 | 359 |

constant except that the pH of the stock before sheet forming was adjusted with either alum or sodium aluminate to the values listed.

In Table VI are presented tests made on commercial unbleached kraft bag papers, one sheet being the regular grade with no resin and the other having melamine resin colloid added at the beaters as dumped. No adjustment of pH was made, so the resin treated paper was slightly lower in pH due to the acid present in the resin solution.

TABLE VI.—HEAT STABILITY TESTS ON UNBLEACHED KRAFT BAG PAPERS

| Sample No. | Melamine Resin Content, % | Hot Water Extract of Paper | | MIT Fold—After Oven Aging, hours | | | Schopper Fold After Oven Aging, hours | | |
|---|---|---|---|---|---|---|---|---|---|
| | | pH | Acidity, % $SO_2$ | 0 | 16 | 72 | 0 | 16 | 72 |
| 2367-G-I | 0 | 5.7 | 0.004 | 685 | 731 | 689 | 2353 | 2187 | 2201 |
| 2367-B-F | 1.9 | 4.9 | 0.037 | 895 | 1180 | 1080 | 2496 | 3170 | 3156 |

Note: Fold test made only in machine direction.

The data on Tables V and VI show that the folding endurance of the resin treated sheets increased appreciably after aging 16 hours, and even after 72 hours was higher than the initial value. The above results are given for illustration only and are not necessarily representative. In fact, tests on a number of untreated versus resin treated papers have varied over a wide range, some showing no decrease or an actual gain in fold after the oven aging test, while others have shown a decrease in fold to 25 to 50% of the initial value. In nearly all cases, however, the final folding endurance of the resin treated sheet has been higher than that of a comparable untreated sheet.

It is evident that variations in cure of the resin, prior to or during the oven aging test, affect the fold values obtained thus introducing a variable not necessarily related to permanence. Consideration of the data indicates that critical reexamination of the heat stability test is required before it can be safely used to indicate the permanence of resin treated paper.

### Laboratory Evaluation Procedure

During the course of extensive laboratory investigations of wet strength problems, several factors have been found to be of special importance in obtaining accurate and reproducible results. These observations are presented as a matter of service to laboratories in the paper industry that are conducting investigations in this field.

For determining wet strength efficiencies it is, of course, necessary to make the test handsheets under carefully standardized conditions. Such factors as stock hydration, pH, order of addition of chemicals, and time of contact of chemicals with the stock should be held constant when other variabls are being studied. In the authors' laboratories standard TAPPI sheet making and sheet testing procedures are followed, except for certain modifications or special provisions as indicated below:

1. A circulating white water system for the sheet machine is desirable for most work, to assure fiber and pH conditions more comparable to commercial practice. Sufficient sheets should be made to reach equilibrium, before the test sheets are prepared.
2. The sheets are pressed between blotters only, instead of between blotters and plates as in TAPPI procedure T-205-m.
3. Sheets (if approximately 50 pounds, 25×40—500) are dried on a blueprint drum drier for 1 revolution (60 sec.) with the drying cylinder held at 240° F. Drying conditions are varied for higher basis weights.
4. The time intervals between sheet formation and pressing, and between pressing and drying, *are very important* and should be standardized carefully as will be described in more detail later.
5. The dried sheets should be conditioned and then tested at some standard interval after drying. This is because full cure of thermosetting resins is not always obtained with normal drying procedures, and the wet strength will progressively increase for several days or even weeks. A convenient procedure is to form and dry the sheets 1 day, then condition (TAPPI 402-m) for about 2 days before testing. At this point changes in wet strength during the working day will be slight.
6. Wet tensile and burst tests are made after soaking the samples in water for 16 to 24 hours.

Particular attention is called to item 4 above, relating to control of the time intervals between sheet formation, drying and pressing. During the early part of the laboratory work on melamine resins for wet strength, unexplained variations in the results occurred. At this time the customary procedure, when making several sets of handsheets, was to accumulate all the sheets between damp blotters on the press (extra long bolts) and then press all the sheets at one time. It was noted that the last sheets made usually showed higher wet strength values (after drying and subsequent testing) than the sheets made earlier.

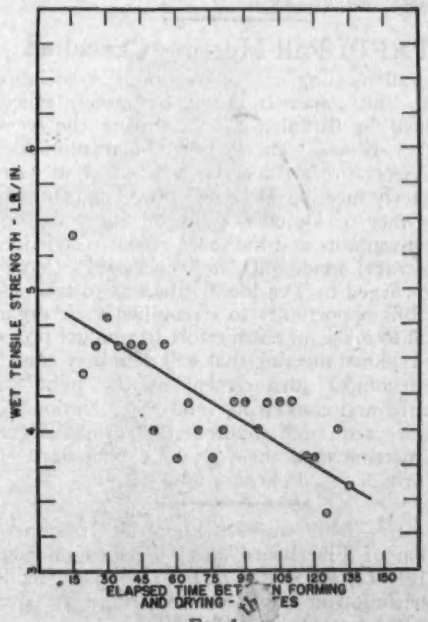


FIG. 11

**Time Variations Between Sheet Formation and Drying—Effect on Wet Strength.**

Investigation of this discrepancy revealed the interesting fact that there is a progressive drop in the wet strength properties of the finished sheet depending upon the time intervals between forming and pressing and between pressing and drying. Some of the experimental data are discussed below.

In one experiment, a set of sheets was made, with 3% of the resin acid colloid furnished, using the British sheet machine without the white water recirculating system. The sheets were made on a slow, set schedule, one sheet being formed every 5 minutes for about 2.5 hours. These sheets were successively stacked up between blotters and the entire stack given standard pressing and then dried immediately. By this procedure a series of sheets was obtained varying only in standing time between forming and pressing.

Wet tensile tests on the individual sheets are shown in Fig. 11, indicating a progressive drop in wet strength as the time interval between forming and pressing was increased. The reason for the drop in wet strength is rather obscure, since moisture and total resin contents remained constant, but presumably some change in resin distribution or orientation, in or on the fibers, is involved.

Regardless of what factors might be involved, it is apparent that existence of a short time interval between sheet formation and pressing contributes to maximum wet strength values, and probably permits closer approximation of commercial operating conditions. This suggests that use of a continuous roll-type press, such as supplied with the Noble and Wood sheet machine, might give better results in wet strength evaluations than the usual type of hydraulic press which requires batch operation, with resulting longer time before drying. However, since the degree of pressing also affects wet strength results, a continuous type press would have to be carefully standardized.

In the meantime the following procedure, involving the regular British sheet machine and press, has been used fairly satisfactorily. For each trial a sufficient number of sheets is run to bring the white water system to equilibrium, and these sheets discarded. Then fifteen sheets are made as rapidly as possible, and accumulated between blotters on the press. Each sheet is numbered serially with indelible pencil. After the set (fifteen sheets) is completed, pressing and drying operations are conducted as rapidly as possible; the total time for forming and drying the sheets is about 30 minutes. Although there is a slight change in wet strength from the first sheet to the last of any set, this variable is minimized by testing all of the sheets, or by selecting sheets of identical serial number.

Using the above procedure, except as noted, three sets of sheets were made with 2% resin colloid furnished. The first set was made according to the

TABLE VII.—EFFECT OF TIME INTERVALS IN SHEET-MAKING PROCEDURE

| Trial | Forming-Pressing-Drying Procedure | Basis Weight, lb. (25×40—500) | Tensile, lb./in. Dry | Tensile, lb./in. Wet | Wet Rub (Aminco) |
|---|---|---|---|---|---|
| 3886A | Form, press, dry (no wait) | 49.8 | 27.6 | 6.0 | 1430 |
| 3886B | Form, press, stand 5 hr., dry | 50.6 | 26.2 | 4.6 | 585 |
| 3886C | Form, stand 5 hr., press, dry | 51.1 | 26.4 | 4.0 | 510 |

above procedure, while for the other two a delay of 5 hours was inserted either between pressing and drying or between sheet formation and pressing. Results are shown in Table VII.

The results of Table VII show again that maximum wet strength is obtained when time intervals are short, and that time intervals must be controlled for most accurate results. The results of trial B were slightly better than those of trial C, indicating that delays before pressing may be more serious than delays after pressing, but before drying. It is also of interest to note that results somewhat similar to the above have been obtained when a urea-formaldehyde resin was added to slush stock and laboratory handsheets prepared.

### Fundamental Investigations

It is not possible at this time to publish details of the fundamental and theoretical work on wet strength paper that is being conducted in the various divisions of the Laboratories with which the authors are associated. This applies not only to the studies of the resin colloid itself, which have already been mentioned briefly, but also to investigation of the mechanisms of resin retention and wet strength development in paper. Since a knowledge of the fundamental nature of the process should assist in utilizing it to full advantage, it is hoped that the following brief discussion of some of the work in progress will be of interest, and that more detailed reports can be presented in the not too distant future.

Particle size, shape, and molecular weight are important characteristics of a substance. In the present case, however, some of the common methods of obtaining such data are not applicable. By electron microscope observations and other means, it has been indicated that the maximum "diameter" of the bulk of the melamine resin colloid particles is approximately 200 Angstrom units (0.02 microns), with the probability that particles even smaller than 100 A in diameter are present.

Sorption studies have indicated that the resin is rapidly adsorbed by cellulose, the process apparently being essentially irreversible under papermaking conditions. The adsorption is undoubtedly influenced by the fact that the melamine resin colloid particles are positively charged and the cellulose negatively charged.

Interesting experiments have been performed by comparing the effects of the melamine resin treatment on the ultimate strength of the fibers of the sheet and the "adhesion" or bonding between the fibers. Analysis of the data indicated that adhesion between both wet and dry fibers is increased appreciably, but that ultimate fiber strength is increased only moderately or not at all. These results are intimately connected with the important question of the distribution of the resin on and in the fibers.

Results of the above studies correlate well with the practical data already described, in which it was shown that resin retention and wet strength increase as the pulp is beaten or refined to a greater extent, and that the fine fiber fractions apparently pick up a greater proportion by weight of resin than do the coarse fractions. It might be noted, however, that the latter effect may be caused not only by increased fiber surface but also by other factors, such as resin flocculation and resultant mechanical entanglement with the small fiber particles.

Another interesting property of the melamine resin colloid is its effect on the sizing properties of rosin and wax sizes. Maxwell has mentioned the improved sizing obtained by incorporation of the resin colloid in sized papers *(2)*, and laboratory studies have indicated that the size "fixing" properties of this versatile material are somewhat similar to those of alum. Further investigation of this phenomenon should prove beneficial.

In view of the complex natures of both cellulose and synthetic resins, it is not surprising that there are many gaps in our understanding of the mechanism of producing wet strength paper from these two materials. Nevertheless, these gaps are being narrowed, and it is believed that continuing study by all concerned will result in the production of better and more useful papers, and thus contribute to the broadening of markets for paper.

### Acknowledgment

The authors wish to acknowledge the contributions and assistance of Drs. D. J. Salley and J. K. Dixon, and Messrs. W. F. Reynolds, A. F. Blockman, C. A. Davis, R. W. Kumler, H. B. Freeman, and many others. Permission of the American Cyanamid Company to publish this material is greatly appreciated.

The data of Table IV are published through the courtesy of Messrs. L. J. Briggs and B. W. Scribner of the National Bureau of Standards.

### Literature Cited

1. Collins, T. T., Jr., *Paper Ind. and Paper World* 25, No. 3: 263-269 (June, 1943).
2. Maxwell, C. S., *Paper Trade J.* 116, No. 19: 39-42 (May 13, 1943); *Tech. Assoc. Papers* 26: 309-312 (June, 1943); *Pacific Pulp Paper Ind.* 17, No. 4: 6-8 (April, 1943).
3. Wohnsiedler, H. P., and Thomas, W. M., U. S. Patent 2,345,543 (March 28, 1944).
4. Kumler, R. W., *Paper Mill News* 66, No. 25: 62 (June 19, 1943).
5. Zaumeyer, R. J., *Paper Trade J.* 117, No. 1: 25-28 (T.S. 1-4) (July 1, 1943).
6. Freeman, H. B., *Paper Mill News* 67, No. 33: 10-12 (August 12, 1944).
7. Britt, K. W., *Chemical Industries* 55, No. 5: 734-737 (November, 1944).
8. Myers, R. J., and Morin, G. V. N., *Paper Trade J.* 117, No. 23: 27-32 (T.S. 241-246); *Tech. Assoc. Papers* 27: 607-612 (June, 1944).
9. Britt, K. W., *Paper Ind. and Paper World* 26, No. 1: 37-46 (April, 1944).
10. Kantrowitz, M. S., Spencer, E. W., and Simmons, R. H., *U. S. Government Printing Office*, Technical Bulletin No. 22 (1940).
11. American Cyanamid & Chemical Corp., Heavy and Paper Chemicals Dept., Tech. Bull. 9B and 13.

## TAPPI Fall Meeting Cancelled

The Fall meeting of the Technical Association of the Pulp and Paper Industry, tentatively scheduled to be held in Buffalo, N. Y., during the week of September 17 was cancelled by the unanimous vote of the Association's Executive Committee at its regular quarterly meeting in New York. The continuation of the Office of Defense Transportation ban on national conventions and the more recent restrictions on civilian travel made this step necessary. Local sections are urged by President Edwards to take advantage of this opportunity to strengthen their organizations and to make an extra effort to conduct programs at their regional meeting that will definitely contribute to the technical advancement of the pulp, paper, paperboard and converting industries. National committees are requested to proceed with plans for the annual meeting to be held at the Commodore Hotel, New York, N. Y., February 24, 1946.

Correction:—T469 sm-45, "Flexural Resistance and Deflection of Fiberboard", as published on page 35 of the July 12, 1945 issue of the PAPER TRADE JOURNAL. The following is the correct form of the equation given in the note under "Report".

Then, $R=\frac{w\,s\,B}{b\,S}$ and $F=d\frac{S^3}{s^3}$

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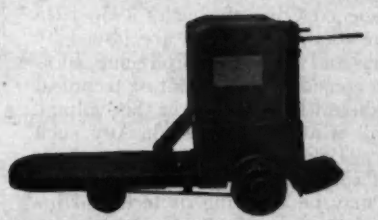
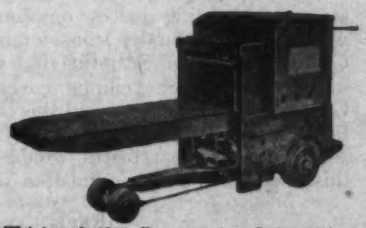
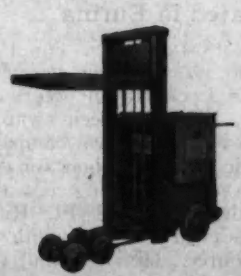


Platform size 24 x 42 x 11" high, low position, 45" high when elevated. Capacity: 2000, 3000, and 4000 pounds.

Capacity 2000 lbs. on forks 30" long. Truck turns from a 5' aisle into an intersecting aisle of 5'.

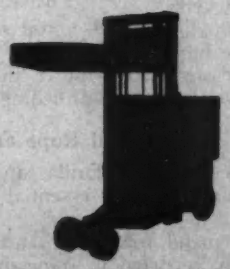


Weight of 4000 lbs. capacity—8250, without battery. Truck turns from a 5' 4" aisle into an intersecting aisle of 4'



Platform 24" wide, 53" long and 11" high, low position. Capacity 2000, 3000 and 4000 pounds

The Wright-Hibbard Telescoping high lift truck is designed to operate in the most congested areas of factories and warehouses. The exceptionally narrow width and short overall length found in other Wright-Hibbard trucks are retained in this model.



Platform 24" wide, 42" long and 9" high, low position. Weight of 4000 lb. capacity—3000 without battery.

# New York Paper and Pulp Market Review

## Less Newsprint and Containerboard Currently Available For Civilian Use—OPA States No Increase In Domestic or Imported Pulp Prices Are Contemplated — Buying of Paper Stock Very Active.

Office of the PAPER TRADE JOURNAL,
Wednesday, August 8, 1945

Increased production of fine papers scheduled in the current quarter is expected to ease the supply situation slightly. The short supply of rosin may, however, prevent the realization of any material increase during the month. The prospect of a better paper supply in the fourth quarter appears favorable. Larger overseas shipments of newsprint have altered the previous favorable report of a larger civilian supply made early last month. Publishers and printers are required to use 5% less newsprint in August, or 95% of their previous quota.

The containerboard supply also appears less favorable than last month. Larger demands for the armed forces is the stated reason. There appears little prospect of an adequate supply of paperboard for civilian consumption this year.

The index of general business activity for the week ended July 28 rose to 140.4, from 139.3 for the previous week, compared with 140.7 in the corresponding week in 1944. The index of paperboard production was 154.2, compared with 154.0 in the previous week, and with 155.4 in the corresponding week in 1944.

Paper production for the week ended July 28 was estimated at 93.4%, compared with 91.3% for 1944, with 90.8% for 1943, with 81.0% for 1942, and with 87.4% for the corresponding week in 1941.

Paperboard production for the week ended July 28 was 93.0%, compared with 96.0% for 1944, with 97.0% for 1943, with 76.0% for 1942, and with 92.0% for the corresponding week in 1941.

### Wood Pulp

The OPA on August 2 stated that no increase above announced ceiling prices on domestic or Swedish wood pulp are under consideration for this year. Ceiling prices for Scandinavian wood pulp are the same as producer ceilings covering domestic and Canadian wood pulp sold in the United States. Since this ruling was announced on June 14, the OPA stated, rumors that prices would be increased later this year, are without foundation.

### Rags

Demand for new cotton cuttings is reported active at this date. Prices continue firmly maintained at ceiling levels.

Supplies of old cotton rags are currently reported more limited. Demand for old whites and blues continue steady. Buying of the roofing grades continues active. Prices are at ceiling levels.

### Old Rope and Bagging

Demand for Manila rope continues urgent to meet requirements for essential industrial and special papers.

Demand for gunny and mill run bagging is currently reported in some quarters as steady. No improvements in scrap bagging is reported at this date. Prices are firm.

### Old Waste Paper

Mill demand for waste paper continues active and is freely absorbing about all available supplies. Prices are strong at ceiling levels.

### Twine

Demand for twine is seasonally active. No change of importance in prices or supply has been reported during the current week.

## TAPPI Notes

John L. Parsons, formerly of the Hammermill Paper Company is now director of research for the Hollingsworth & Whitney Company, Waterville, Maine.

J. Ronald Atwater, formerly of the Office of Price Administration is now assistant to the president of Mead Sales Company, 230 Park Ave., New York.

Merrill A. Youtz, formerly of the Drackett Company is now research chemist for the Battelle Memorial Institute, Columbus, Ohio.

Gilbert Stevens is now assistant director of research for the Minnesota and Ontario Paper Company, International Falls, Minn.

Leslie L. Larson, formerly of the Chemical Warfare Service is now technical director for the Detroit Sulphite Pulp & Paper Company, Detroit, Mich.

D. T. Jackson is now assistant director of the Laboratories of the Hammermill Paper Company, Erie, Pa.

W. M. Ebersole has returned from the Army and is with the St. Joe Paper Company, Port St. Joe, Fla.

TAPPI Collective Bibliography: The Technical Association has in preparation a collective bibliography of papermaking covering the years 1936-1945 inclusive. From time to time bulletins are issued by paper and machinery and materials producing companies that contain a considerable amount of technical information which should be recorded in this volume for the benefit of all who are interested. Any such material issues since 1936 should be sent to C. J. West, Institute of Paper Chemistry, Appleton, Wis. The subject matter may be anything of technical interest to the pulp and paper industry. Copies sent to Appleton will be preserved in the Institute Library for reference use by staff and students.

## Bonner Decorated in Burma

CHINESE COMBAT COMMAND, U. S. A.—PFC Glenn B. Bonner, 25, who was a paper maker at Castena Paper Company in Lock Haven before entering the army in March, 1944, has been awarded the Combat Infantryman's badge and two campaign stars for his Asiatic-Pacific theater ribbon for service in Burma. He received his training at Camp Blanding, Fla., Ft. Meade, Md., and Ft. Riley, Kansas, before going overseas to see action with the 475th in the Mars Task Force. His wife and two children live at 436 S. Jones St., Lock Haven, Pa., and he is a son of Mrs. G. B. Bonner of Avis, Pa.

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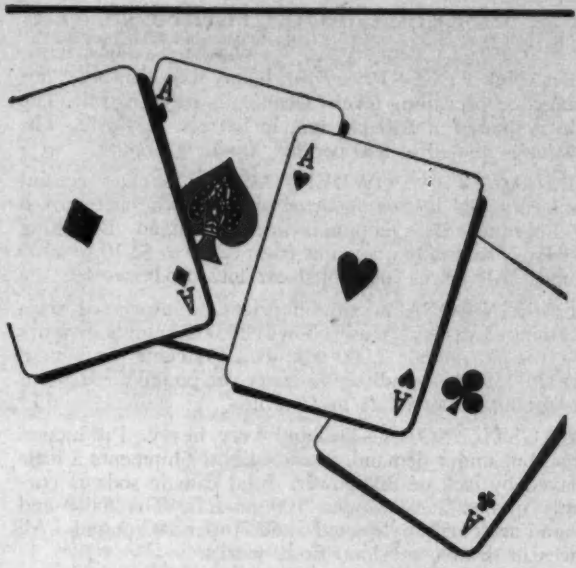

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# MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, August 8, 1945.

BLANC FIXE—Prices on blanc fixe continue unchanged at prevailing levels. Demand is reported fair. The pulp is quoted at $40 per ton, in barrels, at works. The powder is quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—All-over demand continues heavy. Production reported high. Allocation removed on February 27. Quotations are unchanged. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more 24 cents per pound; 2,000 pounds, 24½ cents per pound, less than 2,000 pounds, 24¾ cents per pound f.o.b. shipping point. Imported 21 to 23 cents.

CAUSTIC SODA—Demand very heavy. Production large, but under demand. Market tight. Shipments a little delayed by lack of manpower. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CHINA CLAY—Current demand is reported moderate on many grades of china clay. Quotations unchanged. Domestic filler clay is quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Military and all essential requirements heavy. April output lower at 103,478 tons. Paper allocated 46,284 tons. Chlorine is currently quoted at $1.75 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—Offerings and sales light. The OPA price on "G" gum rosin is $5.79 per 100 pounds in barrels, at Savannah. "FF" rosin is established quoted at $5.75 per 100 pounds, in barrels at New York. Average price on seventy per cent gum rosin size is $5.95 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake continue to be reported unchanged. Domestic salt cake is currently quoted at $15 per ton, in bulk. Chrome cake is currently quoted at $16 per ton. All quoted prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand for soda ash is reported to absorb current production. Market still is tight. Prices continue to conform to prevailing levels. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Corn market is reported steady. Offerings fair at this date. Demand heavy. Prices unchanged on starch. Pearl is quoted at $3.72 per 100 pounds. Powdered starch is quoted at $3.83 per 100 pounds. All prices in bags, car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand good. Supply situation is favorable. Prices of the commercial grades are currently quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.75 per 100 pounds. All prices in bags, car lots, f.o.b. works.

SULPHUR—Current consumption of sulphur continues heavy. Market situation unchanged. The quotation on Annual contracts continues at $16 per long ton, f.o.b. mines. The current price on contracts at Gulf Ports is $17.50 per long ton.

TALC—Demand reported good. Domestic grades are currently quoted at from $16 to $21 per ton at mines. Canadian at $24 per ton. All prices in car lots.

# MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

## Paper

(Delivered New York)

| | | | |
|---|---|---|---|
| **Standard News, per ton—** | | | |
| Roll, contract | *$61.00 | @ | — |
| Sheets | 69.00 | @ | — |
| * OPA Maximum Price. | | | |
| **Kraft—per cwt.—Carload Quantities Zone A, Delivered** | | | |
| Superstandard Wrapping | *$5.25 | @ | — |
| No. 1 Wrapping | *5.00 | " | — |
| Standard Wrapping | *4.75 | " | — |
| Standard Bag | *4.375 | " | — |
| * OPA Manufacturers' Prices. | | | |
| **Tissues—Per Ream—Carlots** | | | |
| White No. 1 | 1.12½ | " | — |
| White No. 1 M. G. | 1.10 | " | — |
| White No. 1½ | 1.00 | " | — |
| White No. 2 | .90 | " | — |
| Anti-Tarnish M.F. | 1.20 | " | — |
| Colored | — | " | — |
| Kraft | .95 | " | — |
| Manila | .90 | " | — |
| **Toilet—1 M. Sheets—Per Case** | | | |
| Unbleached | 4.25 | " | — |
| Bleached | 5.70 | " | — |
| Unbl. Toilet, 1 M. | 4.16 | " | — |
| Bleached Toilet | 5.70 | " | — |
| **Paper Towels, Per Case—** | | | |
| Unbleached, Jr. | 2.20 | " | — |
| Bleached, Jr. | 3.20 | " | — |
| **Manila—per cwt.—C. l. f. a.** | | | |
| No. 1 Jute | 11.25 | @ | — |
| No. 1 Manila Wrapping, 35 lb. | 6.00 | " | 6.25 |
| No. 2 Manila Wrapping, 35 lb. | 5.75 | " | 6.00 |
| **Boards, per ton—** | | | |
| News | *$50.00 | @ | — |
| Chip | *$50.00 | " | — |
| Sgl. Mla. Lt. Chip | *62.00 | " | — |
| White Pat. Coated | *75.00 | " | — |
| Kraft Liners 50 lb. | *63.00 | " | — |
| Binders Boards | 84.00 | " | 116.00 |

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

**Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:**

| | Bonds | Ledgers |
|---|---|---|
| 100% Rag Ext. No. 1 | $39.10 @ $46.00 | $40.25 @ $47.25 |
| 100% Rag | 32.20 " 37.75 | 33.35 " 39.25 |
| 85% Rag | " " | 29.90 " 35.00 |
| 75% Rag | 23.00 " 27.00 | 24.15 " 28.25 |
| 65% Rag | " " | 22.80 " 27.75 |
| 50% Rag | 18.70 " 22.75 | 19.90 " 24.25 |
| 25% Rag | 16.40 " 20.00 | 17.55 " 21.50 |

Colors at $1.00 cwt. extra.

**Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:**

| | Bonds | Ledgers |
|---|---|---|
| No. 1 | 10.55 @ $12.75 | $11.70 @ $14.25 |
| No. 2 | 9.65 " 11.75 | 10.80 " 13.25 |
| No. 3 | 9.20 " 11.25 | 10.35 " 12.50 |
| No. 4 | 8.90 " 10.75 | 10.05 " 12.25 |

Colors $1.00 cwt. extra.

**Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:**

| | | |
|---|---|---|
| No. 1 Glossy Coated | $13.65 @ | $15.30 |
| No. 2 Glossy Coated | 12.40 " | 14.00 |
| No. 3 Glossy Coated | 11.60 " | 13.25 |
| No. 4 Glossy Coated | 11.15 " | 12.75 |
| No. 1 Antique (watermarked) | 10.25 " | 11.75 |
| No. 2 Offset | 9.60 " | 11.00 |
| A Grade E. F. | 9.35 " | 10.75 |
| A Grade S. & S. C. | 9.60 " | 11.00 |
| B Grade E. F. | 8.85 " | 10.25 |
| B Grade S. C. | 9.10 " | 10.50 |
| C Grade E. F. | 8.55 " | 9.75 |
| C Grade S. C. | 8.80 " | 10.00 |
| D Grade E. F. | 8.25 " | 9.50 |
| D Grade S. & S. C. | 8.50 " | 9.75 |

Ivory & India at $.50 cwt. extra.

## Wood Pulp

**OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.**

| | |
|---|---|
| Bl. Softwood Sulphite | $86.00 |
| Unbl. Softwood Sulphite | 74.00 |
| Bl. Hardwood Sulphite | 83.50 |
| Unbl. Hardwood Sulphite | 71.50 |
| Bl. Mitscherlich | 81.00 |
| Unbl. Mitscherlich 72.00 @ | 82.00 |
| N. Bleached Sulphate | 86.00 |
| S. Bleached Sulphate | 79.00 |
| N. Semi-Bleached Sulphate | 82.00 |
| S. Semi Bleached Sulphate | 75.00 |
| N. Unbl. Sulphate | 73.00 |
| S. Unbl. Sulphate | 63.50 |
| Bl. Soda | 76.00 |
| Unbl. Soda | 72.00 |
| Groundwood | 50.00 |

**Transportation Allowances**

**Applying to Producers of Wet Wood Pulp.**

| | Below 50% Air Dry Weight |
|---|---|
| Northeast | $13.50 |
| Lake Central | 13.50 |
| Southern | 16.00 |
| West Coast (in area) | 10.50 |
| West Coast (out area) | 16.50 |

| | 50%-80% Air Dry Weight |
|---|---|
| Northeast | 11.50 |
| Lake Central | 11.50 |
| Southern | 14.00 |
| West Coast (in area) | 9.50 |
| West Coast (out area) | 15.50 |

**Applying to Producers of Dry Wood Pulp.**

| | Above 80% Air Dry Weight |
|---|---|
| Northeast | $8.50 |
| Lake Central | 8.50 |
| Southern | 11.00 |
| West Coast (in area) | 7.50 |
| West Coast (out area) | 13.50 |

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

## Domestic Rags

**New Rags**

(Prices to Mill f. o. b. N. Y.)

| | | |
|---|---|---|
| **Shirt Cuttings—** | | |
| New White, No. 1 | 6.50 @ | 7.25* |
| Silesias No. 1 | — " | 5.75* |
| New Unbleached | 6.75 " | 7.50* |
| Blue Overall | — " | 5.50* |
| Fancy | — " | 3.50* |
| Washables | — " | 3.00* |
| Bleached Khaki Cuttings | — " | 4.25* |
| Unbleached Khaki Cuttings | — " | 3.50* |

*OPA Maximum Prices

# West Virginia Pulp and Paper Company

230 Park Ave.
New York

35 East Wacker Drive
Chicago

Public Ledger Building
Philadelphia, Pa.

503 Market St.
San Francisco, Cal.

Manufacturers of

**ENGLISH FINISH BOOK**
**SUPERCALENDERED BOOK**
**and LITHOGRAPHIC PAPERS**

Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers, Machine Coated

**HIGH GRADE COATED BOOK**

• • • •

**KRAFT WRAPPING AND KRAFT ENVELOPE**
**KRAFT LINER BOARD**
**BLEACHED SULPHITE AND SODA PULP**
**BLEACHED AND UNBLEACHED KRAFT PULP**

MILLS:

Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Charleston, South Carolina

EVERY detail casts its "shadow"—its effect—upon the total. The ensemble cannot be right unless all its components are right. For more than 40 years Lindsay wire cloth has been woven with painstaking care for a myriad of "little things".

**THE LINDSAY WIRE WEAVING COMPANY**
*Serving the Paper Industry Since 1903*
14001-14299 ASPINWALL AVE., CLEVELAND 10, O.

# Price & Pierce Ltd.

## WOOD PULP & PAPER AGENTS

for domestic and export

60 East 49nd Street,
New York 17, N.Y.



# CLINTON

## STARCHES

*Special Grades for Beater, Calender and Tub Sizing.*

•

**QUALITY**
**UNIFORMITY**
**SERVICE**

•

**CLINTON COMPANY**
Clinton, Iowa

### Old Rags

| | | | |
|---|---|---|---|
| White, No. 1— | | | |
| Repacked | *3.80 | " | — |
| Miscellaneous | *3.20 | " | — |
| White, No. 2— | | | |
| Repacked | *2.90 | " | — |
| Miscellaneous | *2.65 | " | — |
| Thirds and Blues— | | | |
| Repacked | *2.20 | " | — |
| Miscellaneous | *1.30 | " | — |
| Roofing Rags— | | | |
| No. 1 | *1.55 | " | — |
| No. 2 | *1.45 | " | — |
| No. 3 (bagging) | *1.35 | " | — |
| No. 4 | *1.35 | " | — |
| No. 5A | *1.35 | " | — |
| Old Manila Rope | 5.75 | " | — |

* OPA Maximum Prices.

### Foreign Rags

Pre-War Quotations

All Prices Nominal

#### New Rags

| | | | |
|---|---|---|---|
| New Dark Cuttings | 2.25 | @ | 2.40 |
| New Mixed Cuttings | 2.00 | " | 2.20 |
| New Light Silesias | 5.50 | " | 5.75 |
| Light Flannelettes | 5:50 | " | 5.75 |
| New White Cuttings | 7.00 | " | 7.50 |
| New Light Oxfords | 4.00 | " | 4.50 |
| New Light Prints | 3.00 | " | 3.25 |

#### Old Rags

| | | | |
|---|---|---|---|
| No. 1 White Linens | 7.50 | " | 8.50 |
| No. 2 White Linens | 6.50 | " | 7.50 |
| No. 3 White Linens | 4.50 | " | — |
| No. 4 White Linens | 2.25 | " | 3.25 |
| No. 1 White Cotton | 4.25 | " | 4.75 |
| No. 2 White Cotton | 3.25 | " | 3.75 |
| No. 3 White Cotton | 2.50 | " | 3.00 |
| No. 4 White Cotton | 1.90 | " | 2.20 |
| Extra Light Prints | 2.00 | " | 2.40 |
| Ord. Light Prints | 1.75 | " | 2.15 |
| Med. Light Prints | 1.55 | " | 1.95 |
| Dutch Blue Cottons | 2.25 | " | 2.50 |
| French Blue Linens | 3.00 | " | — |
| Checks and Blues | 2.00 | " | — |
| Linsey Garments | 1.90 | " | 2.00 |
| Dark Cottons | 1.50 | " | 1.60 |
| Old Shopperies | 1.30 | " | 1.45 |
| New Shopperies | 1.45 | " | 1.50 |
| French Blues | 2.25 | " | 2.50 |

### BAGGING

(Prices to Mill, f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign | Nominal | | |
| Domestic | 3.25 | @ | 3.30 |
| Wool Tares, light | 3.25 | " | 3.50 |
| Wool Tares, heavy | 3.50 | " | 3.75 |
| Bright Bagging | 3.25 | " | 3.50 |
| Manila Rope— | | | |
| Foreign | — | " | — |
| Domestic | *5.75 | " | — |
| Jute Threads | 5.50 | " | — |
| No. 1 Sisal Strings | *4.00 | " | — |
| Mixed Strings | 2.00 | " | — |

* OPA Maximum Prices.

### Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

| | | | |
|---|---|---|---|
| No. 1 Hard White Envelope Cuts, one cut | 3.37½ | @ | — |
| No. 1 Hard White Envelope Cuts | 3.12½ | " | — |
| No. 1 Hard White Shavings, unruled | 2.87½ | " | — |
| No. 1 Hard White Shavings, ruled | 2.50 | " | — |
| Soft White Shavings, one cut | 2.87½ | " | — |
| No. 1 Soft White Shavings | 2.50 | " | — |
| Soft White Shavings, Misc. | 2.15 | " | — |
| No. 1 Fly Leaf Shavings | 1.67½ | " | — |
| No. 2 Fly Leaf Shavings | 1.12½ | " | — |
| No. 1 Groundwood Fly Leaf Shavings | 1.25 | " | — |
| No. 2 Mixed Groundwood Fly Leaf Shavings | .90 | " | — |
| Mixed Colored Shavings | .75 | " | — |
| Mixed Groundwood Colored Shavings | .90 | " | — |
| Overissue Magazines | 1.67½ | " | — |
| No. 1 Heavy Books & Magazines | 1.92½ | " | — |
| Mixed Books | 1.10 | " | — |
| No. 1 White Ledger | 2.30 | " | — |
| No. 2 Mixed Ledger, colored | 2.00 | " | — |
| New Manila Envelope Cuttings, one cut | 2.87½ | " | — |
| New Manila Envelope Cuttings | 2.65 | " | — |
| Extra Manilas | 1.95 | " | — |
| Mixed Kraft, Env. & Bag Cuttings | 2.75 | " | — |
| Kraft Envelope Cuttings | 3.25 | " | — |
| Triple Sorted, No. 1 Brown Soft Kraft | 2.50 | " | — |
| New 100% Kraft Corrugated Cuttings | 2.25 | " | — |
| No. 1 Assorted Old Kraft | 1.75 | " | — |
| New Jute Corrugated Cuttings | .90 | " | — |
| Old 100% Kraft Corrugated Containers | 1.75 | " | — |
| Old Corrugated Containers | 1.40 | " | — |
| Box Board Cuttings | .72½ | " | — |
| White Blank News | 1.65 | " | — |
| Overissue News | 1.10 | " | — |
| No. 1 News | 1.00 | " | — |
| No. 1 Mixed Paper | .95 | " | — |
| Old Corrugated Containers | .82¼ | " | — |
| Mill Wrappers | 1.10 | " | — |

### Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

| | | | |
|---|---|---|---|
| Coarse Polished— | | | |
| India | .21 | @ | — |
| White Hemp | .21 | " | — |
| Fine Polished— | | | |
| Fine India | .26 | " | — |
| Unpolished— | | | |
| Box | .17¾ | " | — |
| Paper Makers | .17 | " | — |
| Tube Rope | .19 | " | — |
| Wall Paper | .20½ | " | — |
| Wrapping | .23 | " | — |
| Soft Fiber Rope | .19 | " | — |
| Cotton | .25 | " | — |

(Hard Fiber)

| | | | |
|---|---|---|---|
| Medium Java | .18 | " | — |
| Mex. Sisal | .16 | " | — |
| Manila | — | " | — |

## PHILADELPHIA

### Domestic Rags (New)

(Price to Mill)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White No. 1 | .07¼ | | |
| New White No. 2 | .05¾ | | |
| Light Silesias | .05¾ | | |
| Black Silesias, soft | .03¾ | | |
| New Unbleached | .07½ | | |
| Washable Prints | .04¼ | | |
| Washable No. 1 | .03 | | |
| Blue Overall | .05½ | | |
| Cottons—According to grades— | | | |
| Washable Shredding | .01¾ | | |
| Fancy Percales | .04¾ | | |
| New Black Soft | .03¼ | | |
| Khaki Cuttings— | | | |
| Unbleachable Cotton Cuttings | .03½ | | |
| Bleachable Cotton Cuttings | .04¼ | | |
| Men's Corduroy | .03½ | | |
| Ladies' Corduroy | .03 | | |
| Cottonades | .03¼ | | |

### Domestic Rags (Old)

| | | | |
|---|---|---|---|
| White No. 1—Repacked | 3.80 | @ | — |
| Miscellaneous No. 1 | 3.20 | " | — |
| Miscellaneous No. 2 | 2.65 | " | — |
| White No. 2—Repacked | 2.90 | " | — |
| Thirds and Blues— | | | |
| Miscellaneous | 1.80 | " | — |
| Repacked | 2.20 | " | — |
| Black Stockings— | | | |
| (Export) | Nominal | | |
| Roofing Stock— | | | |
| Foreign No. 1 | Nominal | | |
| Domestic No. 1 | 1.55 | " | — |
| Domestic No. 2 | 1.45 | " | — |
| Roofing Bagging | 1.35 | " | — |
| Old Manila Rope | 5.75 | " | — |

### Bagging

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign | Nominal | | |
| Domestic | 3.00 | @ | 3.50 |
| No. 1 Clean bright— | | | |
| Sisal Strings | .04 | " | — |
| No. 2 Clean bright— | | | |
| Sisal Strings | .03 | " | — |
| Sisal Jute | .02½ | " | .02¾ |
| Scrap— | | | |
| No. 1 | 3.25 | " | 3.50 |
| No. 2 | 1.75 | " | 1.80 |
| Wool Tares, heavy | 4.00 | " | 4.25 |
| No. 1 New Light Burlap | 3.00 | " | 4.00 |
| New Burlap Cuttings | 3.75 | " | 4.00 |

### Old Papers

(F. o. b. Phila.)

OPA Maximum Prices, Baled

| | | | |
|---|---|---|---|
| No. 1 Hard White Envelope Cuts, one cut | 3.37½ | " | — |
| No. 1 Hard White Shavings, unruled | 2.87½ | " | — |
| Soft White Shavings, one cut | 2.50 | " | — |
| White Blank News | 1.65 | " | — |
| Soft White Shavings, Misc. | 2.15 | " | — |
| No. 1 Heavy Books & Magazines | 1.92½ | " | — |
| Overissue Magazines | 1.67½ | " | — |
| New Manila Envelope Cuttings | 2.65 | " | — |
| No. 1 Assorted Old Kraft | 1.75 | " | — |
| No. 1 Mixed Paper | .95 | " | — |
| Box Board Cuttings | .72½ | " | — |
| Kraft Corrugated Cuttings | 2.25 | " | — |
| Old Corrugated Containers | 1.40 | " | — |
| Overissue News | 1.10 | " | — |
| No. 1 News | 1.00 | " | — |

## BOSTON

### Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

| | | | |
|---|---|---|---|
| No. 1 Hard White Shavings, unruled | 2.87½ | @ | — |
| No. 1 Hard White Shavings, ruled | 2.50 | " | — |
| Soft White Shavings, Misc. | 2.15 | " | — |
| No. 1 Fly Leaf Shavings | 1.67½ | " | — |
| No. 2 Fly Leaf Shavings | 1.12½ | " | — |
| No. 1 Groundwood Fly Leaf Shavings | 1.25 | " | — |
| No. 2 Groundwood Fly Leaf Shavings | .90 | " | — |
| Mixed Colored Shavings | .75 | " | — |
| New Manila Envelope Cuts, one cut | 2.87½ | " | — |
| Hard White Envelope Cuts, one cut | 3.37½ | " | — |
| Triple Sorted No. 1 Brown Soft Kraft | 2.50 | " | — |
| Mixed Kraft Env. & Bag Cuttings | 2.75 | " | — |
| Kraft Envelope Cuttings | 3.25 | " | — |
| No. 1 Heavy Books & Magazines | 1.92½ | " | — |
| New Manila Envelope Cuts, one cut | 2.87½ | " | — |
| New Manila Envelope Cuttings | 2.65 | " | — |
| White and Colored Tabulating Cards | 2.25 | " | — |
| Ground Wood Tabulating Cards | 1.35 | " | — |
| White Blank News | 1.65 | " | — |
| No. 1 Assorted Old Kraft | 1.75 | " | — |
| No. 1 Mixed Paper | .95 | " | — |
| Overissue News | 1.10 | " | — |
| Box Board Cuttings | .72½ | " | — |
| New Corrugated Cuttings, Kraft | 2.25 | " | — |
| Old 100% Kraft Corrugated Containers | 1.75 | " | — |
| Old Corrugated Containers | 1.40 | " | — |
| Jute Corrugated Cuttings | 1.07½ | " | — |

### Bagging

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Gunny Bagging— | | | |
| Foreign | (nominal) | | |
| Domestic | 2.75 | @ | 2.90 |
| Sisal Rope No. 1 | *4.75 | " | — |
| Sisal Rope No. 2 | * — | " | 4.00 |
| Mixed Rope | — | " | 1.55 |
| Transmission Rope— | | | |
| Foreign | (nominal) | | |
| Domestic | 2.75 | " | 3.00 |
| Manila Rope— | | | |
| Foreign | (nominal) | | |
| Domestic | 5.75 | " | — |
| Soft Jute Rope | 4.50 | " | 5.00 |
| Jute Carpet Threads | 3.00 | " | 3.50 |
| Bleachery Burlap | 8.50 | " | 9.00 |
| Scrap Burlap— | | | |
| Foreign | (nominal) | | |
| Domestic | 3.00 | " | 3.25 |
| South American | — | " | 3.25 |
| Wool Tares— | | | |
| Foreign | (nominal) | | |
| Domestic | 4.25 | " | — |
| Aust. Wool Pouches | — | " | 3.65 |
| New Zealand Wool Pouches | — | " | 3.50 |
| New Burlap Cuttings | 4.75 | " | 5.00 |
| Heavy Baling Bagging | 4.00 | " | 4.25 |
| Paper Mill Bagging | 2.50 | " | 3.00 |
| No. 2 Roofing Bagging | 1.35 | " | — |

* OPA Maximum Prices.

### Domestic Rags (New)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New Light Prints | .04½ | @ | .04¾ |
| Fancy Percales | .04¼ | " | .05 |
| New White No. 1 | .06¾ | " | .07 |
| New Light Flannelettes | .05½ | " | .06 |
| Canton Flannels, Bleached | .06 | " | .06¾ |
| Underwear Cutters, Bleached | .06¼ | " | .06¾ |
| Underwear Cutters, Unbleached | .05¾ | " | .06 |
| Silesias No. 1 | .06 | " | .06¾ |
| New Black Silesias | .03 | " | .03¾ |
| Red Cotton Cuttings | .03½ | " | .04 |
| Soft Unbleached | .06½ | " | .06¾ |
| Blue Cheviots | .05½ | " | .06 |
| Fancy | .02¾ | " | — |
| Washable | .02¾ | " | — |
| Khaki Cuttings | .02¾ | " | .03 |
| O. D. Khaki | .03½ | " | .03¾ |
| Corduroy | .03¼ | " | .03½ |
| New Canvas | .06¼ | " | .06½ |
| B. V. D. Cuttings | .06¼ | " | .06½ |

### Domestic Rags (Old)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| White No. 1— | | | |
| Repacked | 3.80 | @ | —* |
| Miscellaneous | 3.20 | " | —* |
| White No. 2— | | | |
| Miscellaneous | 2.65 | " | —* |
| Twos and Blues, Repacked | 2.20 | " | —* |
| Old Blue Overalls | 2.25 | " | 2.50 |
| Thirds and Blues, Repacked | 2.20 | " | —* |
| Miscellaneous | 1.80 | " | —* |
| Black Stockings | 3.50 | " | 4.00 |
| Roofing Stock— | | | |
| No. 1 | 1.55 | " | —* |
| No. 2 | 1.45 | " | —* |
| No. 3 | 1.35 | " | —* |
| No. 4 | 1.35 | " | —* |
| No. 5, Quality A | 1.35 | " | —* |
| Quality B | 1.20 | " | —* |
| Quality C | .95 | " | —* |
| Old Manila Rope | 5.75 | " | —* |

* OPA Maximum Prices.

### Foreign Rags

(F. o. b. Boston)

| | |
|---|---|
| Canvas | (nominal) |
| Dark Cottons | (nominal) |
| Dutch Blues | (nominal) |
| New Checks and Blues | (nominal) |
| Old Fustians | (nominal) |
| Old Linsey Garments | (nominal) |
| New Silesias | (nominal) |

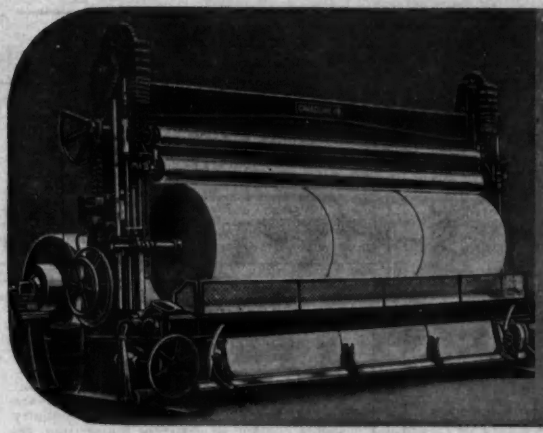
## CHICAGO

### Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White Envelope Cuts, one cut | 3.37½ | @ | — |
| No. 1 Hard White Shavings, unruled | 2.87½ | " | — |
| No. 1 Soft White Shavings | 2.50 | " | — |
| No. 1 White Ledger | 2.30 | " | — |
| No. 1 Heavy Books & Magazines | 1.92½ | " | — |
| White Blank News | 1.65 | " | — |
| Mixed Kraft Env. & Bag Cuttings | 2.75 | " | — |
| No. 1 Assorted Old Kraft | 1.75 | " | — |
| Overissue News | 1.10 | " | — |
| No. 1 News | 1.00 | " | — |
| No. 1 Mixed Paper | .95 | " | — |
| No. 1 Roofing Rags | 1.55 | " | — |
| No. 1 Roofing Bags | 1.45 | " | — |



**LARGEST CYLINDER BOARD MACHINE in the world is equipped with CAMERON 19 WINDER**

CAMERON 19 Winder is built in widths up to 192". Runs at speeds up to 2800 f.p.m. on paper or 1500 f.p.m. on board. Winds rolls to diameters up to 40" on paper or 60" on board. Write for interesting folder.

**CAMERON MACHINE COMPANY**
61 Poplar Street Brooklyn 2, N. Y.
Midwest Office: 111 West Monroe St., Chicago 3, Ill.

*Producers of*

# SULPHUR

**Large stocks carried at all times, permitting prompt shipments . . . Uniformly high purity of 99½% or better . . . Free of arsenic, selenium and tellurium.**

TEXAS GULF SULPHUR Co.
75 E. 45th Street New York 17, N.Y.
Mine: Newgulf, Texas

**UNITED BLACKS**

**KOSMOS • DIXIE**

**PARIS BLACKS**

Carbon blacks for all paper and board stocks—outstanding soft texture, particle fineness and jet black color. Takes well to the fiber, shows high retention.

Best for performance in the Beater and Jordan because of ease of wetting and ready dispersion in the furnish.

**UNITED CARBON CO., INC.**
CHARLESTON, WEST VIRGINIA
NEW YORK • AKRON • CHICAGO

EXCELSIOR KNOX Woolen Co. Camden, Me. FELTS & JACKETS

**"EXCELSIOR" FELTS**

Manufacturers of Felts of Superior Quality for Every Grade of Pulp and Paper

**KNOX WOOLEN COMPANY**
CAMDEN, MAINE

## HELP WANTED

**WANTED**
**GENERAL MANAGER OF HIGHEST TYPE FOR OUTSTANDING FOLDING CARTON PLANT**

Exceptional opportunity is presented to right individual who has background of technical experience and executive ability to become affiliated with one of the most successful folding carton manufacturers in the country. Remuneration to the right man will be most liberal and includes share in the profits. Applicant should give detailed history of background, education, business experience and age.

The employees of the company know of this advertisement. Box 45-468 care Paper Trade Journal. A-9

**ASSISTANT SUPERINTENDENT**

Exceptional opportunity for a young man with good educational and paper making background. Applicant should be experienced on Fourdrinier & Cylinder Yankee machines making light weight, creped tissues.

List experience, references and personal data in first letter. All correspondence strictly confidential. Our employees have been notified of this advertisement.

Address replies to Box No. 45-470 care Paper Trade Journal. A-16

**HELP WANTED**

For New Mill in Mexico making nine point straw:

3 Tour Bosses
3 Machine Tenders
3 Beater Men
1 Superintendent

Address Box No. 45-462 care paper Trade Journal. A-30

Mechanical Engineer wanted with experience in power plant and maintenance, preferably with paper mill experience. Address Box 45-466 Paper Trade Journal. A-9

Civil or Mechanical Draftsman wanted. Must be experienced in plant layout and building design, preferably with paper mill experience. Address Box 45-467 Paper Trade Journal. A-9

A large Northeastern pulp and paper manufacturer has attractive openings for several chemists or chemical engineers with sound technical backgrounds and experience in the development aspects of the manufacture and conversion of pulp and paper. Address Box 45-465 care Paper Trade Journal. A-23

## HELP WANTED

**CHARLES P. RAYMOND SERVICE INC.**
**294 Washington St., Boston, Mass.**
Specializing in Paper Mill Personnel
Positions Now Open

Manager for molded pulp mfg.
Woodlands Manager: if able to purchase and take full charge, attractive compensation
Manager two machine paper mill
Salesmen and sales managers to sell equipment to paper mills, also salesmen and sales managers for paper mill
Laboratory men, chemists, technical directors and assistants
Mechanical, design, structural, electrical, industrial and plant engineers (many openings)
Draftsmen and designers
Accountants and assistant purchasing agent
Tour boss, machine, back tenders and beater engineers
Manager paper converting plant $10,000 year and bonus
Night superintendent roofing felt plant
Master Mechanics
And many others

We invite correspondence (strictly confidential) with employers seeking personnel and men seeking new positions. A-9

CHEMIST with organization ability and initiative for responsible position in quality control work with Midwest manufacturer of packaging materials. Background in resing desirable. Address Box 45-428 care Paper Trade Journal. A-16

# CLASSIFIED ADVERTISING

**HELP WANTED**—5c a word. Double rate for heavy face type. Minimum charge $1.25.

**SITUATIONS WANTED**—5c a word, double rate for heavy face type. Minimum charge $1.25. If repeated ½ rate will be charged for each consecutive repetition.

**FOR SALE**—5c a word. Double rate for heavy face type. Minimum charge $1.25.

**WANTED**—5c a word. Double rate for heavy face type. Minimum charge $1.25.

**OPPORTUNITIES**—5c a word. Double rate for heavy face type. Minimum charge $1.25.

Classified advertising space may also be purchased at $3.00 per single column inch.

All classified advertisements are payable in advance.

If box number is used—35 cents additional.

**Address Replies**

to advertisements appearing under Box Numbers in care of
PAPER TRADE JOURNAL
15 West 47th Street
New York 19, N. Y.

## HELP WANTED

**WANTED**
**PAPER MILL MANAGER**

A position is now opened in an operating paper mill, located in Southern Michigan (not Kalamazoo), for a capable and experienced paper mill executive to take full charge; must be familiar with all phases of production and administrative problems.

In reply give full details, including compensation desired, all of which will be confidential. Address Box 45-430 care Paper Trade Journal. A-9

**CHEMICAL ENGINEER**

For position as Assistant Chief Chemist in large southern kraft pulp and paper mill. Position is permanent with excellent opportunities for advancement. Applicant should have five to ten years experience in the kraft industry. Letter of inquiry should contain all pertinent information, regarding education, experience, service status, etc. Rules and regulations of the War Manpower Commission will be observed. Address Box 45-417, care Paper Trade Journal. A-9

**WANTED**

TOUR BOSS, MACHINE TENDER, SHIPPING CLERK. Board Mill located in Northeastern Pennsylvania, making Folding Grades.

Extensive plans for expansion under way.

Excellent post-war future assured. Permanent jobs, good chances for advancement for the right men.

Only men looking for permanent connection and steady work need apply. Box 45-411 care Paper Trade Journal. A-23

**WANTED**

Machine operators for Aluminum foil paper laminating, lacquering and sheeting machines. Modern paper converting factory located in New York City. Write or call on Mr. Saunders for descriptions of these jobs showing rates, hours, incentives, etc.

**KELLER-DORIAN CORPORATION**
516 West 34th Street
New York 1, N. Y. A-9

**WANTED**—**BEATER ENGINEER**—Mid-western mill making high grade rag content bond and ledgers wishes beater engineer with sufficient experience to supervise beating of rag and sulphite. Permanent position for man with right qualifications. Address Box 45-442 care Paper Trade Journal. A-16

**WANTED**—We need a graduate chemist in our expanding product development laboratory who has a background of paper chemistry and is familiar with all types and kinds of paper coatings including resins and lacquers. Address Box 45-398 care Paper Trade Journal. A-16

**WANTED**—**CHIEF CHEMIST** for pulp and paper mill located on Pacific Coast. Apply in own handwriting giving references, experience and other pertinent information. Address Box 45-243 care Paper Trade Journal. TF

**WANTED**—A recent college graduate in paper chemistry to work in our laboratory on paper coating compounds and heat sealing compounds. Address Box 45-397 care Paper Trade Journal. A-16

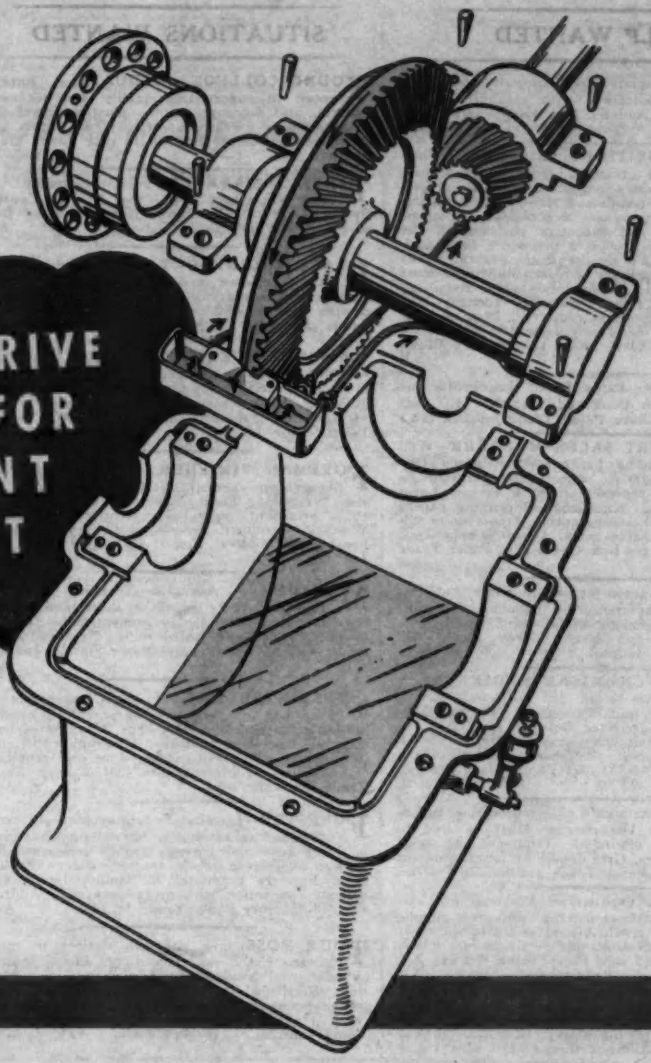
**MACHINE TENDER** for cylinder machine operations. Must be experienced at this particular kind of machine operations. Prefer high school graduate or equivalent. Address Box 45-293 care Paper Trade Journal. TF

**WANTED**—Chief Engineer and Master Mechanic. Must have paper mill experience. Reply to T. J. Russell, Manager, Sangamon Paper Mills, Eaton, Indiana. A-9

**WANTED**—Mechanical Engineer with several years' experience in the pulp and paper industry for pulp and paper mill in Middle West. Please state age, experience, salary expected, Draft Status. Address Box 45-426 care Paper Trade Journal. A-9

**WANTED**—**TOUR BOSSES** for Roofing Felt Mill. Excellent opportunity for right man. Postwar future. Send complete resume giving experience, etc. to Box 45-427 care Paper Trade Journal. A-9

# DOWELED DRIVE BEARINGS FOR PERMANENT ALIGNMENT



A sixty-second glance at the cutaway drawing of a Black-Clawson drive will show you plenty.

FIRST . . notice that Black-Clawson bearings are assembled on the shaft . . . then properly aligned in the lower case . . . then actually doweled in place.

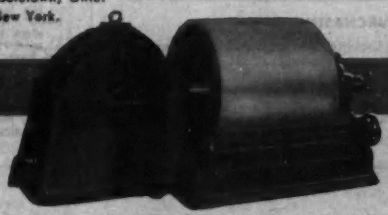
SECOND . . notice an injury-proof oiling system lubricates each bearing.

We recognize that this construction is simplicity itself. Yet this very simplicity means that gears are properly meshed with no chance of misalignment . . . that there are no external screws to collect dust or to invite tampering . . . that oil starved bearings are a thing of the past.

Ask us to show you the many other Black-Clawson drive features.

**THE BLACK-CLAWSON COMPANY, Hamilton, Ohio**

DIVISIONS: Shartle Bros. Machine Co., Middletown, Ohio.
Dilts Machine Works, Fulton, New York.



## HELP WANTED

**ADJUSTER**—Square, flat, specialty machines, excellent opportunity with established firm. Give experience. Address Box 45-438 care Paper Trade Journal. A-9

**SALARIED POSITIONS** $2,500-$25,000. Post-war plans are creating lifetime opportunities now. This thoroughly organized confidential service of 35 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated, through a procedure individualized to each client's requirements. Several weeks are required to negotiate and each individual must finance the cost of his own campaign. Retaining fee protected by refund provision. Identity covered and present position protected. Plan now for post-war security. Send only name and address for details. R. W. BIXBY, INC., 117 Delward Bldg., Buffalo 2, N. Y. TF

**WANTED**—Two Paper Sheet Cutter Machine Operators for Book and Specialty Mill. Address Box 45-440 care Paper Trade Journal. A-23

**PAPER EXPORT SALES MANAGER**—Well established leading paper concern needs District Sales Manager to direct sales through already established representatives in various Latin American markets. Knowledge of printing papers also fluent Spanish indispensable. Opportunity advancement for capable party. Describe experience background. Address Box 45-445 care Paper Trade Journal. A-9

**YOUR BOSS** wanted for mill in South America. Must have experience on cylinder and fourdrinier machines making tissue, laced boards, corrugating medium and liners. Address Box 45-452 care Paper Trade Journal. A-23

**CHEMIST** or **CHEMICAL ENGINEER** for technical service work in midwestern kraft, sulfite and paper mill. Permanent. Persons with some experience preferred but not essential. Answers should contain all necessary information on education, experience, references, salary desired, etc. Address Box 45-453 care Paper Trade Journal. A-16

**WANTED**—Thoroughly experienced men in finishing room Department. Must be able to operate sheeters, rewinders, Trimmers and good tiers. Good salaries. Give details by letter. Address Box 45-454 care Paper Trade Journal. A-9

**WANTED**—An experienced Foreman for Finishing Department. One who can handle men and produce results. Good salary to the right party. State qualifications and details in first letter. Address Box 45-455 care Paper Trade Journal. A-9

**WANTED**—Young graduate chemist or chemical engineer to be trained for technical sales service. Good opportunity with old well-established company. Good starting salary. Give full particulars first letter. Address Box 45-459 care Paper Trade Journal. A-16

**CHEMICAL** Company in metropolitan New York area has opening for a chemist familiar with the problems of paper coatings and finishes involving resins. Address Box 45-460 care Paper Trade Journal. A-30

**YOUR** Bosses, Machine Tenders and Backtenders wanted by tissue mill near New York City. Men familiar with the manufacture of facial tissue and two ply toilet tissue will be given preference. Reply in hand writing, listing work experience. Our men have been informed of this advertisement. Address Box 45-471 care Paper Trade Journal. A-16

**WANTED — ENGINEERS** — Capable of handling general engineering work in established consulting engineers office specializing in pulp and paper mills. Address Box 45-469 care Paper Trade Journal. TF

## SITUATIONS WANTED

**PURCHASING AGENT**

If you are looking for a capable, honest and aggressive purchasing agent to handle selection of suppliers, expediting, disposal of surplus, initiating use of new materials, inventories, material control, acceptance, subcontracting, traffic and inspection kindly contact box 45-424 care of Paper Trade Journal. A-16

## SITUATIONS WANTED

**YOUNG COLLEGE GRADUATE** — Experienced in supervision, quality and technical control, also coatings, resins, plastics and board manufacturing—seeks opportunity in paper and allied fields. Address Box 45-381 care Paper Trade Journal. TF

**TRAFFIC MANAGER** position wanted. 23 years experience with the N. Y. Central System. Age 38. Business ability. Address Box 45-433 care Paper Trade Journal. A-9

**PLANT ENGINEER**—Technical graduate with long experience in design, construction, maintenance and operation of Pulp and Paper Mills, desires position. Address Box 45-410 care Paper Trade Journal. A-9

**MARKETING EXECUTIVE.** High grade man with broad background, who is able to work in dual capacity; having, also, wide experience in paper manufacturing. College education. Age 44. Location immaterial. Address Box 45-436 care Paper Trade Journal. A-16

**FOREMAN FINISHER** or Converting Plant Supervision—Years diversified experience, Tissue, Wrapping, Bond, Envelope, Waxed Papers, etc., proficient operator instructor, Sheeting, Winding, Trimmer, Scheduling, Shipping, Warehousing etc. Address Box 45-441 care Paper Trade Journal. A-23

**MANAGER** or Assistant—Technical graduate. Eighteen years excellent diversified experience technical control, development and operation of pulp, paper and board mills. Now employed. Address Box 45-449 care Paper Trade Journal. A-16

**SUPERINTENDENT**—20 years experience in paper bag conversion of grocery, sacks and aniline or oil ink specialty bags. Capable of handling all bag shop problems. Thorough experience in supervision of help, maintenance and repairing of machines. Address Box 45-450 care Paper Trade Journal. A-30

**FORESTER**—Logging Superintendent—10 years experience as estimator, buyer, superintendent of large pulp operations, sawmill manager. Extensive experience truck, tractor, waterways logging. Forestry graduate, 32, family. Desire permanent connection with progressive mill. Address Box 45-458 care Paper Trade Journal. A-16

**YOUR BOSS** now engaged, desires to make change. Fully experienced on facial tissues, cylinder and Yankee Fourdrinier machines. Married. Good habits. Steady worker. Been with present company 8 years. Would consider machine tender. Address Box 45-475 care Paper Trade Journal. A-9

## FOR SALE

**REVAMPING AND BUILDING MILL AND CAN OFFER FOR SALE**

One large Breaker Beater complete
One small Beater Complete
1—30" Diameter X 60" Face cylinder mold
1—8x8 Shartle Duplex plunger stock pump
1—New pair cast steel double suspension spring type beater bearings for 8" diameter journal—Noble & Wood beater roll. Never used
1—Used old style lighter beam for 8" diameter journal Noble & Wood beater
1—New reinforced design lighter beam for 8" diameter journal—Noble & Wood beater roll. Pattern No. 863. Never used.
3—200 KVA —33000-2300/4000 volts transformers
1—250 H.P. slip ring motors & controls—450 R.P.M.—3 bearing base and pulley
60—52" Face steel dryer felt rolls—1—7/16" journals
1—20" Face cast iron taper pulley—2 15/16" bore taper 31"x29½"
4—52" diameter x 83" face dryers
1—4" to 10" Cox & Sons Pipe threading machine
1—48"x48" Noble & Wood beater roll with filling installed
1—40" Noble & Wood Impeller for circulation stock in beater.

A visit to the mill would prove profitable as we have many items for sale to numerous to mention. See our superintendent Mr. O. P. Fussell at our plant in Walloomsac, New York.

**WALLOOMSAC PAPER MILLS, INC.**
Mills: Walloomsac, New York
Main Office: 25 Vanderbilt Avenue
New York 17, New York TF

## FOR SALE

**FOR SALE**

1—Saveall 36" x 136" Cylinder Mold equipped with anti-friction bearing and couch roll.
1—Shartle Bros. Decker 36" diameter x 60" face including couch roll.
1—120" Fourdrinier Wet End.
1—68" Drilled Face Suction Press Roll.
1—#9 Emerson Jordan for direct connection to a motor, requires use of 400 H.P. motor.
1—Shartle Brothers Duplex 10 x 20 Stock Pump.
1—Moore & White 10 x 12 Triplex Stock Pump.
2—2000 lb. Holyoke Beaters.
1—1000 lb. Dayton Beater.
1—Jones pulper — direct connected to 60 H.P. motor.
2—12 Plate Packer type flat screen with steel vats.
2—8 Plate Flat Screens.
1—12 Plate Flat Screen.
1—18 Plate Flat Screen with scraper.
13—Driers 60" x 154".
1—Buffalo Pump—5500 g. p. m., direct connected to 100 H.P. Motor (50' head).
1—#4 Roots-Connersville Vacuum Pump.
2—65" Cameron tension for winders.

*Various sizes of Centrifugal Pumps. Write us regarding your particular requirements.*

***We are always in the market to purchase your surplus or idle machinery. What have you to offer?***

**J. J. ROSS COMPANY**
250 Frelinghuysen Ave.
Newark 5, N. J.
Bigelow 3-3720 A-9

**FOR SALE**
**REBUILT ELECTRICAL MACHINERY**
**SLIP RING MOTORS**
3 ph. 60 cy.

| HP | Make | Speed | Voltage |
|---|---|---|---|
| 200 | G.E. | 240 rpm | 2200/440/220 |
| 150 | G.E. | 600 rpm | 2200/440/220 |
| 150 | Westgh. | 600 rpm. | 440/220 |

Large stock of AC & DC Motors.

AC and DC Generating Equipment.
2—300 KW G.E. R. Converters 250 V. DC with transformers 2300 or 4000 Volt.
60 KVA Allis Chal. Turbo 240 V. 3 ph. 60 cy.
50 KW Westgh. Turbo 125 Volt D.C.
50 KW Westgh. Engine unit 125 Volt D.C.

*Dealing in Rebuilt Electrical Machinery, exclusively, for a quarter of a century.*

**MOORHEAD-REITMEYER CO., INC.**
30th & Brereton Sts. Pittsburgh, Pa.
A-9

**FOR SALE**
New and guaranteed used steel pipe, boiler tubing, valves, fittings, wood and steel tanks, steel buildings
JOS. GREENSPON'S SON PIPE CORP.
NATIONAL STOCK YARDS, Illinois.
8-6

FOR SALE | FOR SALE | FOR SALE

# Ross Paper Machinery Co., 17 Porter Ave., Newark 8, New Jersey, Waverly 3-5675

## 146" Pulp Drying Machine—200 ton per day drying capacity.

*Prints and additional information on request.*

### BEATERS
1—2500 lb. Downingtown Iron Tub
1—750 lb. Downingtown Iron Tub
2—1000 lb. Horne Iron Tub
1—1200 lb. Holyoke Wood Tub

### CALENDER STACKS
1—9 Roll Lobdell 124" Warren Doctors
1—10 Roll Farrell 104" Warren Doctors
1—11 Roll Pusey & Jones 104" Warren Doctors

### CONVERTING EQUIPMENT
1—Bliss Double Head Stitcher
1—Bliss Single Head Stitcher
1—Bliss Box Assembling Machine
1—66" Dietz Towel Winder
4—Waterville Grinders
1—42" Parry Liner & Combiner
1—36" Waldron Reeling Machine
1—39" Dampening Machine
1—36" Brush Coating Machine
1—Copper Mixing Tank with agitator—40 gal.
1—Cast Iron Kettle 20" x 24" 2 outlets

### DRYERS
5—48" diam.—102" face—2 deck frames.
40—36" diam. 86" face 3 deck frames
18—36" diam. 82" face 2 deck frames
40—28" diam. 96" face 2 deck frames

### FESTOON DRYERS
100" Proctor & Schwartz
60" Proctor & Schwartz

### FLAT SCREENS
1—Moore & White 8 Plate
1—Moore & White 10 Plate
1—Sandy Hill Packer 10 Plate
2—Sandy Hill 8 Plate-Scraper
1—Sandy Hill 8 Plate-Scraper New Type Roller Cams.
1—Trimbey Pulp Screen 30 ton cap.

### JORDANS
1—E. D. Jones Standard motor drive
1—Dillon No. 2 Motor drive
1—Appleton No. 2 motor drive
1—Noble & Wood Monarch Belt Drive
1—Emerson No. 2 Belt Drive

### KNIFE GRINDER
1—72" Seybold automatic

### MISCELLANEOUS
1—Warren Broke Target with pump
2—Yankee Dryer doctor oscillators (Beloit)
2—Nugent Oil Filters (new)
2—Beloit Fourdrinier Shakes
1—Oster Pipe Threading Machine 2" to 6" direct conn. to motor

### MOTORS
1—30 h.p. 600 R.P.M. 2300 V. 3 Ph. 60 cy.
1—40 H.P. 3600 R.P.M. 2300 V. 3 Ph. 60 cy.

### PLATERS
2—Holyoke 2 Roll 18" dia. 36" face

### PULP EQUIPMENT
2—Pusey & Jones vertical Digesters (welded) 7' dia., 24' high 125 lb. pressure
8—Horizontal Digesters 15' diam. 47' face 150 lb. pressure
3—Improved No. 2 Knotters
1—Nichols-Herreshoff Lime Kiln
1—Williams No. 30 Bark Hog
1—Sumner Disc Barker 72" dia.

### PULPERS
1—Sturtevant Bale Pulper with conveyor & motors
1—Voith Pulper No. 1-20 tons cap.

### PUMPS
1—Pusey & Jones 5" x 8" Stock.
1—DeLaval 6" x 6"
1—Oliziti Acid 3" Suction.
1—Warren 4800 g.p.m. 80' head
1—Frederick 600 g.p.m. 50' head (stock)
1—Midwest 6" stock pump

### REELS
2—Pusey & Jones 104" face 18" dia. bowls
1—Pusey & Jones 115" face 18" dia. bowls
1—2-bowl 100" face 20" dia. bowls

### SATURATOR
1—Guyton-Cumfer 5 gates

### SAVEALL
1—A. D. Wood cylinder 48" dia. 60" face

### SHEETER
1—100" Hamblet Duplex with Reeves Drive

### SLITTERS & WINDERS
1—100" Warren two drum.
2—104" Warren two drum.
1—116" Warren two drum.
1—72" Pusey & Jones two drum.
1—140" Warren two drum.

### SPEED REDUCERS
1—Philadelphia ratio 60 to 1 5 H.P.
1—Philadelphia ratio 600 to 1 2 H.P.
2—Grant ratio 7 to 1 5 H. P.
1—Oliver ratio 51 to 5.1 5 H.P.
1—Cleveland ratio 47 to 1 23 H.P.

### STUFF PUMPS
2—12" x 12" Goulds triplex
8—10" x 20" Shartle triplex
1—12" x 20" Shartle triplex
1—8" x 18" Shartle triplex
1—12" x 16" Shartle triplex
1—8" x 10" Shartle triplex
1—7" x 16" Shartle duplex

### SUCTION FELT ROLLS
1—Downingtown 12" diam. 106" drilled face
1—Downingtown 10" diam. 106" drilled face

### VACUUM PUMPS
1—14" x 20" Connersville
1—12" x 18" Connersville

### WASHERS (Beaters)
1—154" face—45" diam. with rigging
1—52" face—52" diam. with rigging

### WET MACHINE
1—No. 4 Bird with motor and speed reducer 15" diam. rubber couch.
1—84" Improved three roll Hydraulic Enclosed drive (used one year)

**CASH PURCHASER OF ALL TYPES OF PAPER, PULP AND CONVERTING EQUIPMENT**
**WANTED—THREE CYLINDER AND TWO FOURDRINIER MACHINES FOR EXPORT—ANY WIDTH**

---

**FOR SALE**

1—Standard Horne Jordan with new shell and plug fillings.
1—300 lb. Valley Iron Works high speed Beater of the Holland type. A-1 condition.
1—Knowlton Spiral Core Machine complete with 36" Langston Rewinder. Immediate delivery.
1—7-roll 48" wide Holyoke Super Calender Stack, complete with 50 H.P. G. E. a.c. 3 phase 60 cycle, 220 volt motor equipment. Machine in perfect condition.
1—62" Heavy Type Hudson Sharp two-shaft Center Wind Slitter and Rewinder. Very suitable for board work.
1—50" Kidder Bears Cut Slitter and Rewinder.
1—84" Left Hand 4 Knife Carthage Chipper with two new sets of knives.
1—36" Camachine 44W Low Model Roll Rewinder. Complete and in good condition.
1—82 Lannoye Pulper complete with 40 H/P A.C. motor equipment. A-1 condition.
1—110" Double-Drum Waldron late type shear cut hydraulic Slitter and Rewinder.
1—Type FC international Folding Paper Box Machine Co.'s Folding and Gluing Machine. Range of sizes on folded cartons 2½" to 10" when folded flat and 3" to 30" long.

**GIBBS-BROWER COMPANY, INC.**
21 East 40th St., New York 16, N. Y.
TF

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**FOR SALE**

3 Dayton beater rolls and frames 64" x 54"
2 Noble & Wood beater rolls and frames 64" x 54"
1 Jones beater roll lava filled 57" x 60"
2 Jones beater rolls lava filled 61" x 48"
2 Noble & Wood Jordans Mammoth Jr.

**SANDY HILL IRON & BRASS WORKS**
Hudson Falls, N. Y.
A-16

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**FOR SALE**

**BEATERS**
1—1000 lbs. Jones, wood tub, roll 61 x 48" Serial No. 46,924, corrugated bars ⅝" on the cutting edge, excellent condition.
1—65 x 84" Jones
1—53 x 48" Jones
1—60 x 60" Horne Patent Wood Tub
1—66 x 42" Noble & Wood
1—24 x 18" Dilts

**CALENDERS**
2—104" 10 roll Machine Calenders

**CUTTERS**
1—72" Acme with spare new Knives
2—64" Hamblet with Mace Pliers

**DRYERS**
24—36 x 82"
15—36 x 81" with frame work
20—42 x 74" with frame work
5—36 x 77"
5—37 x 72"

**FOURDRINIERS**
1—72" Fourdrinier part
1—90" Fourdrinier part, 50' wire

**JORDANS**
1—Noble & Wood Mamouth Jr. new filling
1—#2 Dillon, new filling

**REEL**
1—120" Horne
1—130" Rice Barton—2 drums

**NAILING MACHINE**
1—49" Morgan Nailing Machine

**ROSSERS**
2—Krause

**PULPERS**
1—#2 Lannoye
1—#1 Lannoye

**ROTARIES**
2—Loring 8' x 20" with Drive and Reducing Valves suitable for 75 lbs. pressure

**FRANK H. DAVIS COMPANY**
175 Richdale Ave., Cambridge 40, Mass.
A-16

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**FOR SALE**

2—63" Dietz Toilet Converters.
1—81" Dietz Toilet Converter.

**J. J. ROSS COMPANY**
250 Frelinghuysen Ave.
Newark 5, N. J.
Telephone Bigelow 3-3720 A-2

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Baldwin and Lima steam locomotives, 58, 56, 50, 42 and 40 tons, std. 56½" gauge.
Porter, Vulcan 36" ga. steam locomotives, 18-17 tons; Milwaukee 8-ton gas, rebuilt.
Porter 52-ton steam S/T locomotive, std. ga.
Whitcomb 8-ton gasoline locomotives, 24" ga.
65-ton and 42-ton gasoline-electric locomotives, standard 56½" gauge.
American steam railway ditcher-crane, 29' boom.
P&H 206-B crane, gas, 40' boom, ¾-yd. bkt.

**H. Y. SMITH CO., Milwaukee 2, Wis.**
A-9

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**FOR SALE**

1—Uniform speed reel with drum 104" wide. Pope type built by Beloit Iron Works.

**Shartle Brothers Machine Co.**
Middletown, Ohio
A-9

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FOR SALE—One No. 97 Davidson suction feeder with ¼ H.P.D.C. Motor. Perfect condition. Bargain. Address Box 45-456 care Paper Trade Journal. A-30

FOR SALE | FOR SALE | FOR SALE

# FOR SALE—PUMPS

## CENTRIFUGAL PUMPS

Ref. No.

37. 1—Allen—4" —350 g.p.m. —40' head — motor base—no motor.

39. 1—Twinvolute—3"—300 g.p.m. — 40' head—motor base—no motor.

65. 1—Lawrence Machine Co. — 4" — 430 g.p.m.—23' head—motor base—no motor.

91. 1—Penn Pump Co.—150 g.p.m.—25' head—motor base—no motor.

128. 1—Worthington—220 g.p.m.—60' head.

129. 1—Foster-Wheeler Corp.—375 g.p.m.—65' head.

135. 1—Foster-Wheeler Corp.—200 g.p.m.—65' head.

137. 1—Taber Pump Co.—160 g.p.m.—30' head.

140. 1—DeLaval—200 g.p.m.—25' head.

142. 1—Worthington—400 g.p.m.—27½' head.

142A. 1—Worthington — 400 g.p.m. — 27½' head.

143. 1—Warren Steam Pump Co.—300 g.p.m. —40' head.

156. 1—Dayton-Dowd Co.—200 g.p.m.—50' head.

160. 1—Deming—160 g.p.m.—30' head.

168. 1—Worthington—330 g.p.m.—70' head.

172. 1—Goulds—600 g.p.m.—50' head.

177. 1—DeLaval—850 g.p.m.—370' head.

182. 1—Earle Gear & Machine Co.—140 g.p.m.—40' head.

184. 1—Novo Engine Company—125 g.p.m. —30' head.

186. 1—Fairbanks Morse—500 g.p.m.—25' head.

189. 1—Worthington—4500 g.p.m.—33' head.

190. 1—DeLaval—5555 g.p.m.—170' head.

201. 1—Fairbanks Morse—900 g.p.m.—76' head.

206. 1—Goulds—200 g.p.m.—150' head.

207. 1—Frederick Iron & Steel—200 g.p.m. —80' head.

208. 1—Allis Chalmers—250 g.p.m.—45' head.

216. 1—Allis Chalmers—130 g.p.m.—50' head.

217. 1—DeLaval—2200 g.p.m.—150' head.

218. 1—Worthington—250 g.p.m.—75' head.

228. 1—Buffalo 5500 g.p.m.—50' head—direct connected to 100 h.p. motor.

## DUPLEX PLUNGER STOCK PUMP

1—10 x 20 Duplex (Shartle).

## STOCK PUMPS

1—Keystone Driller Co.—450 g.p.m.—50' head (Reference 64).

1—Morris Machine Works—3 x 4 (Reference 114).

1—Frederick Iron & Steel Co.—open impeller—275 g.p.m.—50' head (Reference 144).

1—Union—Belt Driven—6 x 8 (Reference 222).

1—Smith & Winchester—Belt Driven—5 x 7 (Reference 225).

1—Fairbanks Morse—Belt Driven—5 x 5 (Reference 227).

1—Lawrence—10". (230)

Various other sizes

## TRIPLEX PLUNGER STOCK PUMPS

1—Moore & White 8 x 10 Triplex Stock Pump.

1—Moore & White 10 x 12 Triplex Stock Pump.

## DUPLEX STEAM PUMP

1—Knowles (Worthington) 7½ x 4½ x 10.

*Complete details regarding any of the above pumps furnished on request.*
*Write us regarding your particular requirements for Pumps if not listed above.*

**J. J. ROSS CO.,** 250 Frelinghuysen Avenue, Newark 5, New Jersey

# FOR SALE

## DRYERS

| Quantity | Diameter | Face | Quantity | Diameter | Face |
|---|---|---|---|---|---|
| 44 | 48" | 44" | 2 | 36" | 80¼" |
| 1 | 36" | 60" | 1 | 28" | 80" |
| 1 | 28" | 63" | 6 | 36" | 80½" |
| 8 | 28" | 62½" | 1 | 36" | 81" |
| 4 | 36" | 64" | 1 | 36" | 82" |
| 2 | 28" | 64" | 23 | 36" | 82½" |
| 1 | 48" | 69½" | 1 | 24" | 82½" |
| 38 | 36" | 70" | 5 | 36" | 85" |
| 9 | 36" | 72" | 3 | 36" | 86" |
| 1 | 36" | 72¾" | 2 | 48" | 86½" |
| 3 | 28" | 72⅝" | 1 | 36" | 90" |
| 3 | 28" | 73" | 19 | 36" | 95" |
| 14 | 36" | 74" | 10 | 48" | 96" |
| 7 | 28" | 74" | 3 | 36" | 98¼" |
| 30 | 42" | 74" | 59 | 36" | 104" |
| 1 | 36" | 74" | 1 | 16" | 108" |
| 3 | 36" | 76" | 2 | 24" | 108" |
| 1 | 24" | 78" | 4 | 36" | 160" |
| | | | 18 | 48" | 160" |

**SHARTLE BROTHERS MACHINE CO.**
MIDDLETOWN, OHIO A-9

## FOR SALE

**PAPER MILL & PAPER CONVERTING EQUIPMENT FOR SALE**

34" Inman Slitter.
42" Firsching Cloth Slitter.
36" Sheridan Automatic Power Paper Cutter.
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Moore & White Co.
Shartle Brothers

**LUBRICANTS**
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

**LUBRICATORS**
Hills-McCanna Co.

**MICROMETERS & CALIPERS**
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Car Wheel Co.
Walker-Goulard-Plehn Co.

**MIXERS**
H. K. Porter Company
Youngstown Welding & Engrg. Co.

**MOISTENING EQUIPMENT**
The Spray Engineering Co.

**MOTORS AND GENERATORS**
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corporation

**PACKING BOXES**
Johnson Corporation
Shartle Brothers Machine Co.

**PACKING**
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

**PAPER MACHINES**
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

**PAPER MACHINE SLICES**
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

**PAPERMILL BUILDERS**
Merritt Chapman & Scott Corp.

**PAPER TUBE MACHINERY**
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

**PASTING MACHINES**
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

**PERFORATED METAL**
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

**PIPE**
Black-Clawson Company
Crane Company
Grinnell Company
Shartle Brothers Machine Co.
Taylor Forge & Pipe Works
Walworth Company
Youngstown Welding & Engrg. Co.

**PLATERS**
Perkins & Son, Inc., B. F.

**PLATES**
Black-Clawson Company
Hendrick Mfg. Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

**PLUGS**
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

**PRESSES**
Black-Clawson Company
Farrel-Birmingham Co.
Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer G.

**PUG MILLS**
Traylor Engineering & Mfg. Co.

**PULPS**
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Black Hansson, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

**PUMPS**
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Frederick Iron and Steel Co.
Hills-McCanna Co.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
Quimby Pump Co. Div. of H. K. Porter Company, Inc.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Company
Worthington Pump & Machinery Corp.

**RECOVERY SYSTEMS**
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp. J. O.
Valley Iron Works Co.

**RECTANGULAR BINS**
Traylor Engineering & Mfg. Co.

**REELS**
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

**REFINERS**
Appleton Machine Co.
Behr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
The Hermann Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Refiner Corp.
Valley Iron Works

**REGULATORS**
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Bristol Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Taylor Instrument Companies
Wallace & Tiernan
Westinghouse Electric Corporation

**RESINS**
American Cyanamid & Chemical Corp.
American Resinous Chemicals Corp.
The Resinous Products & Chemical Co.

**ROLLS**
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
D. J. Murray Mfg., Co.
Noble & Wood Machine Co.
Perkins, B. P., & Sons Co.
Pusey & Jones Corp.
Roehlen Engraving Co.
J. J. Ross Company
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

**ROLL COVERS**
The Cincinnati Rubber Mfg. Co.
Youngstown Welding & Engrg. Co

**ROLL STANDS**
Cameron Machine Co.
Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

**ROTARY KILNS**
Traylor Engineering & Mfg. Co.

**SATURATING MACHINES**
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

**SCALES**
Builders-Providence, Inc.
Merrick Scale Mfg. Co.

**SCREEN PLATES**
Pitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

**SCREENS**
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.

**SCRUBBERS**
Traylor Engineering & Mfg. Co.

**SHEET MACHINES**
Thomas W. Hall Co.
The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

**SHOWER PIPES**
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

**SHREDDERS**
Bauer Brothers Co.
Carthage Machine Co

**SIZING**
American Cyanamid & Chemical Co.
American Resinous Chemicals Corp.
Black-Clawson Company
The Dow Chemical Co.
du Pont, E. I., de Nemours & Co.
National Oil Products Co.
Paper Makers Chemical Department, Hercules Powder Co.
Pioneer Sale Company
Socony-Vacuum Co.
Philadelphia Quartz Co.

**SLITTERS**
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Johnstone Eng. & Machine Co.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

**SPRAY NOZZLES**
The Spray Engineering Co.

**STAINLESS STEEL**
Allegheny Ludlum Steel Co.
Eastern Stainless Steel Corp.
Industrial Steels, Inc.

**STARCH**
American Cyanamid & Chemical Corp.
Clinton Co.
National Starch Products, Inc.
Stein, Hall & Co., Inc.

## WHERE TO BUY

**STEAM SPECIALTIES**
Johnson Corp.
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

**STRAPPING & STRAPPING MACHINES**
Acme Steel Company
The Stanley Works

**STUFF CHESTS**
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

**SUCTION BOXES**
Black-Clawson Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Westinghouse Electric Corp.

**SULPHUR**
American Cyanamid & Chemical Corp.
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

**SULPHUR BURNERS**
Valley Iron Works Co.

**TALC**
American Cyanamid & Chemical Corp.
W. H. Loomis Talc Corp.
International Talc Company

**TANKS**
Frederick Mfg. Co.
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Noble & Wood Machine Co.
H. K. Porter Company Inc.
Rodney Hunt
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co.

**THICKENERS, DECKERS & SAVEALLS**
Bird Machine Company
Bulkley, Dunton Pulp Co. Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

**TITANIUM**
E. I. Du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

**TOOLS**
Acme Steel Company
Ingersoll-Rand Co.
The Stanley Works
Walworth Company

**TRUCKS**
Elwell Parker Electric Co.
Wright-Hibbard Ind. Elec. Truck Co.

**TRAPS**
Armstrong Machine Works
Crane Co.
Grinnel Company
Johnson Corporation
Shartle Bros. Mch. Co.

**TUBS**
Rodney Hunt Machine Co.
Noble & Wood Machine Co.
Shartle Brothers
Valley Iron Works Co.

**TURBINES**
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Company
Hunt, Rodney, Mach. Co.
Westinghouse Electric Corp.
Worthington Pump & Machinery Corp.

**USED EQUIPMENT**
Frank H. Davis Company
Gibbs-Brower Co.
Thomas W. Hall Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Shartle Brothers Machine Co.

**VALVES**
The Bristol Company
Crane Company
Dilts Machine Works
Fibre Making Processes, Inc.
The Foxboro Company
Hills-McCanna Co.
E. D. Jones & Sons Co.
Kennedy Valve Mfg. Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co
The Permutit Company
William Powell Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co
Taylor Instrument Companies
Valley Iron Works Co.
Walworth Company

**VATS & VAT PARTS**
Union Machine Co.
Union Screen Plate Co.

**WASHERS**
Bird Machine Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

**WATER CONDITIONING**
The Permutit Company

**WAXING MACHINERY**
Black-Clawson Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

**WELDING EQUIPMENT**
Allis-Chalmers Mfg. Co.
General Electric Company
Walworth Company
Westinghouse Electric Corp.

**WET MACHINES**
Black-Clawson Co.
Carthage Machine Co.
Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

**WINDERS AND REWINDERS**
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co.
Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
Johnstone Eng. & Machine Co.
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

**WIRES**
Appleton Wire Works
Black-Clawson Company
Bulkley, Dunton Pulp Co. Inc.
Cheney Bigelow Wire Works
Hayden Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Shartle Brothers Machine Co.

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